Grass Valley Application Note

DPM-700 Procedure to Clear Dual-Ported RAM

Introduction

The DPM-700 uses Dual-Ported RAM (DPRAM) for cross processor communications and shared data storage. If a power glitch occurs when one of the processors is writing to DPRAM, the data being written into DPRAM may be corrupted. After the power glitch has passed the processors will resume operation and use the data stored in DPRAM, even if the some of the data has been corrupted. This will result in the DPM-700 operating erratically or "crash" completely. This may happen immediately or occur some time later. To correct this problem DPRAM must be "cleared out" as described in the steps given in this procedure.

CAUTION

Do not "short out" the battery on the 064700 board of the DPM-700 to clear the DPRAM, as this will greatly shorten the life of the battery or permanently damage it and does not guarantee the DPRAM values will be initialized to the correct values. (DPRAM values are random in nature when DPRAM is initially powered on, using the "Reboot" procedure will initialize the DPRAM to the correct values.)

Publication Number: TP0521-00A

© May 1995

Procedure

WARNING

Backup all E-MEM registers and setups onto a floppy disk before performing this procedure. Since all E-MEM and setup files are stored in DPRAM, the files will be erased as a result of executing this procedure.

---

1. Power down the DPM-700 frame.
2. Insert the system software disk into the control panel disk drive.
3. Power up the DPM-700 frame.
4. The Streamline display will read:

   Disk will ERASE E-MEMs / Setups! Continue?

   Yes No

5. Press **Yes.**
6. The Streamline display will read:

DPM-700 Flash EEPROM Programmer

Prgrm Verify CPUs Reboot Vrsn

7. Select **Reboot**.
8. The Streamline display will read:

Please Remove System Software Disk

And Then Press - - - - - - - - -> Reboot

9. Remove the system software disk.
10. Press **Reboot**.
11. The DPM-700 will re-initialize itself and "clear out" the DPRAM.
12. This completes the "clearing out" DPRAM procedure.

NOTE: *If a customer experiences AC power failures and "Brown-Outs" a great deal, the best solution for the customer, would be to purchase a UPS (Uninterruptible Power System) for their site.*

DIGITAL PICTURE MANIPULATOR

DPM-700 PAL/NTSC SERVICE MANUAL

(VOLUME 1)

Assembly Number: 084760
TP Number: TP0341-00
Dec 95
Issue: B2

Grass Valley Group
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P.O. Box 1114
Grass Valley, CA 95945
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Grass Valley Group

EC Declaration of Conformity

We

Tektronix Holland N.V.
Marktweg 73 A
8444 AB HEERENVEEN
THE NETHERLANDS

declare under sole responsibility that the

Model DPM
DPM-700 PAL
DPM-700 CV

manufactured by the Grass Valley Group, a Tektronix Company meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility and the Low Voltage Directive 73/23/EEC.

89/336/EEC EMC Directive
  EN 50081-1
    EN55022 Class B Radiated and Conducted Emissions

  EN 50082-1 Immunity

IEC 801-2	Electrostatic Discharge Immunity
IEC 801-3	RF Electromagnetic Field Immunity
IEC 801-4	Electrical Fast Transient/Burst Immunity

73/23/EEC Low Voltage Directive
  EN 60950 "Safety of Information Technology Equipment"

Sophia Meyer 9/5/95
Sophia Meyer, (Acting) Product Line Manager Date

Sophia Meyer 9/5/95
Sophia Meyer, Quality Manager Date

10/3/95
Jaap Meijer, EC Representative Date

⚠ IMPORTANT SAFEGUARDS

INSTRUCTIONS PERTAINING TO RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

WARNING

1. TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT OPEN THE EQUIPMENT ENCLOSURE. REMOVING THE COVER OR OPENING THE ENCLOSURE MAY EXPOSE DANGEROUS VOLTAGES. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
2. ANY INSTRUCTIONS IN THIS MANUAL THAT REQUIRE OPENING THE EQUIPMENT COVER OR ENCLOSURE ARE FOR USE BY QUALIFIED SERVICE PERSONNEL ONLY. TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.
3. Read all safety and operating instructions before operating this unit.
4. Retain all safety and operating instructions for future reference.
5. Heed all warnings on the unit and in the operating instructions.
6. Do not use this product in or near water.
7. Slots and openings in the cabinet are provided for ventilation. Do not block them.
8. This product should be powered only as described in the manual.
9. Ensure proper connection of the three-wire, grounding (earthing) type power plug.
10. Route power cords and other cables so that they are not likely to be damaged.
11. Disconnect power before cleaning. Do not use liquid or aerosol cleaners; use only a damp cloth.
12. Refer to qualified service personnel if:
    - Power cord or plug is damaged
    - Liquid or objects have gotten inside the unit
    - Unit has been exposed to water
    - Unit does not operate correctly
    - Unit has been dropped or damaged
    - Performance changes significantly
13. Use only specified replacement parts.
14. Have qualified personnel perform safety checks after any completed service.
15. Correct power and fuses: The equipment may be damaged if you do not select the correct ac input voltage and fuses before applying power. Refer to the instructions later in this section under the heading "Selecting the AC Line Voltage and AC Fuse".
16. Static electricity damage: This unit contains components which are vulnerable to static electricity discharge. Wear a grounding strap to prevent static discharge when handling the equipment.
17. To prevent damage from electrical arcing to circuitry and connectors, be sure to turn off the main power switch on the unit before connecting or disconnecting cables and before removing or inserting modules.
18. Equipment Overheating: The frame is cooled by two internal fans. Ensure that the fans operate and that air flow is not blocked, otherwise heat damage to the system can occur. The control panel requires no special cooling.
19. Do not apply power to the GPI outputs in excess of the relay's maximum rating of 28 volts, 100 milliamperes, or damage may occur.
20. To avoid electrical damage to the modules, be sure you use the correct extender (analog or digital) when troubleshooting or aligning a module.

The front and back of this page contain cautionary information required by UL 1419

Revision 2

SYMBOLS WHICH MAY BE USED ON THIS EQUIPMENT

SYMBOL	SYMBOL DEFINITION
⏚ IEC 417, Symbol 5019	PROTECTIVE GROUNDING TERMINAL: A terminal which must be connected to earth ground prior to making any other connections to the equipment.
∿ IEC 417, Symbol 5032	A terminal to which or from which an alternating (sinewave) current or voltage may be applied or supplied.
⎓ IEC 417, Symbol 5031	A terminal to which or from which a direct current or voltage may be applied or supplied.
≂ IEC 417, Symbol 5033	A terminal to which or from which an alternating and direct current or voltage may be applied or supplied.
⚠ IEC348	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.
⚡	The lightning flash (not red) with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
⚡ red color IEC 417, Symbol 5036	HIGH VOLTAGE TERMINAL: A terminal at which a voltage, with respect to another terminal or part exists or may be adjusted to 1000V or more.
○ IEC 417, Symbol 5008	This symbol indicates the principal on/off switch is in the off position.
I IEC 417, Symbol 5007	This symbol indicates the principal on/off switch is in the on position.
⧈	Double Insulated (IEC Safety Class II) Equipment: This marking indicates the equipment complies with the requirements for double insulation.
△ _A_V IEC 417, Symbol 5016-a within an equilateral triangle	This symbol indicates that the fuse must be replaced with one having the ratings indicated.

DPM-700 REGISTRATION CARD

HELP US TO HELP YOU BY FILLING OUT AND RETURNING THIS REGISTRATION CARD TODAY

Returning this card is the only way we can reach you and provide you with the latest technical changes (i.e. software updates, manual revisions, application notes, field modification notes, and product updates) for the DPM-700.

Please enter below the serial numbers located on the back of the control panel and the electronics frame. Also please enter the GVG Job number from the packing slip or the top of any shipping box.

Control Panel __________ Electronics Frame __________

GVG Job # __________

Name ____________________ Name of Alternate Contact ____________________
Company ____
Street ____
City ____
State ______________ Zip __________ Country ____________________
Telephone ____
(area code)

Date Purchased ____

SOURCE OF ACQUISTION

☐ Professional Video Distributor (name) ____________________
☐ System Contractor (name) ____________________
☐ Grass Valley Group Salesperson (name) ____________________
☐ Other ____________________

PRIMARY APPLICATION (you may choose more than one if applicable)

☐ Broadcast
☐ Corporate Training, Product Promotion, Video Newsletter
☐ Educational Programming
☐ Government/Military Programming
☐ Commercial Production or Post-Production
☐ Other ____________________

TYPE OF INSTALLATION

☐ Studio (live programming)
☐ Studio/Post Production Editing System
☐ Post Production Editing System
☐ Graphics Composition System
☐ ENG/EFP Remote Production Vehicle
☐ Master Control
☐ Film to Tape Transfer System
☐ Other ____________________

TP0341-001

Please provide the following information about the equipment capabilities of your DPM-700 system: (check all appropriate boxes for which you have the capability)

VIDEOTAPE MACHINES

☐ 1"
☐ 3/4"
☐ 1/2" Component (Beta or MII Format)
☐ D1
☐ D2
☐ Other ____________________

STILL STOREOR SOLID-STATE DISK

☐ No
☐ Yes (Manufacturer and Model Number)
____

OTHER DIGITAL EFFECTS SYSTEM

☐ No
☐ Yes (Manufacturer and Model Number)
____

EDITING SYSTEM

☐ No ☐ Yes (Manufacturer and Model Number) ____________________
☐ Are you using GPI contact closures ☐ Yes ☐ No
☐ Are you using Serial Interface ☐ Yes ☐ No

FUTURE PURCHASE PLANS

____
____
____

COMMENTS (or call Grass Valley Group, PSD Marketing)

____
____

Fold Here and Tape Closed

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PREFACE

INTRODUCTION

The Service Manual (TP0341-00) provides functional and maintenance information for the DPM-700 Digital Picture Manipulator. This information is presented as an aid for operators and service personnel to enable them to install, operate, and maintain the system.

The Service Manual includes:

Section 1	General Description
Section 2	Installation
Section 3	Operating Instructions
Section 4	Functional Description
Section 5	Maintenance
Section 6	Parts Lists
Section 7	Change Information
Section 8	Drawings

ASSEMBLY NUMBERS

All electronic frame and control panel assemblies are identified by an assembly number. This number is silk-screened on the component side of each module. The assembly number identifies the type of module, the module version, and the issue letter.

For example, the Frame Control Processor module is identified by the assembly number **064700-xxA**. The first six numbers is the module number. The **-xx** following this identifies the version of the module; and the letter **A** tells what issue the module is.

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Section 1
General Description

INTRODUCTION TO THE SYSTEM

This section of the manual gives you a general overview of your DPM-700 Digital Picture Manipulator.

Subjects Covered:

- Video Input Signals
- Transform and Self Keys
- Changing the Picture's Size, Shape and Position
- Creating Motion Paths
- Video Output Signals
- Quick Reference Feature Checklist
- Physical Configuration
- Standard Features
- Options

Your DPM-700 Digital Picture Manipulator is an ideal tool for creating striking and beautiful video effects. It has been designed to emphasize picture quality, versatility, and user-friendly control.

What the DPM-700 can do for You

The DPM-700 lets you change the appearance of video and make it move in programmed patterns; all of this takes place in full three-dimensional (3D) space.

To explain in more detail, the DPM-700 can

- select one or more video input signals and digitize them,
- process them into either transform key or self key signals,
- manipulate them to change their size, shape and/or position,
- create motion paths for the changing shapes to follow,
- and then output the new video images to the next stage of your system.

The picture on Page 1-3 shows a simplified diagram of the signal path through the DPM-700.

Video Input Signals

A standard DPM-700 comes with a single channel, Channel 1, which has two separate inputs: A and B. You can add an optional Channel 2 which has its own A and B inputs. Both channels are available in either analog or digital format; you choose the format at the time of purchase. Note that the channels can be configured differently; that is, you can use one for analog inputs and the other for digital inputs, giving you maximum flexibility in designing your system.

Input signals to the DPM-700 can come from cameras, edit suites, character generators, switchers and routers, video tape recorders, or other video devices. Several options are available from Grass Valley Group which multiply the number of possible inputs to the DPM-700.

- The DPM-133/133-2 and DPM-134/134-2 are 10 x 1 Input Selectors which let you connect up to ten different inputs per channel and then select them from the DPM-700 control panel.

- If you have a Model 200 switcher with Auxiliary buses installed, you can use one of them to provide inputs to your DPM-700; use the Model 200 control panel or the Satellite control panel to select these inputs.

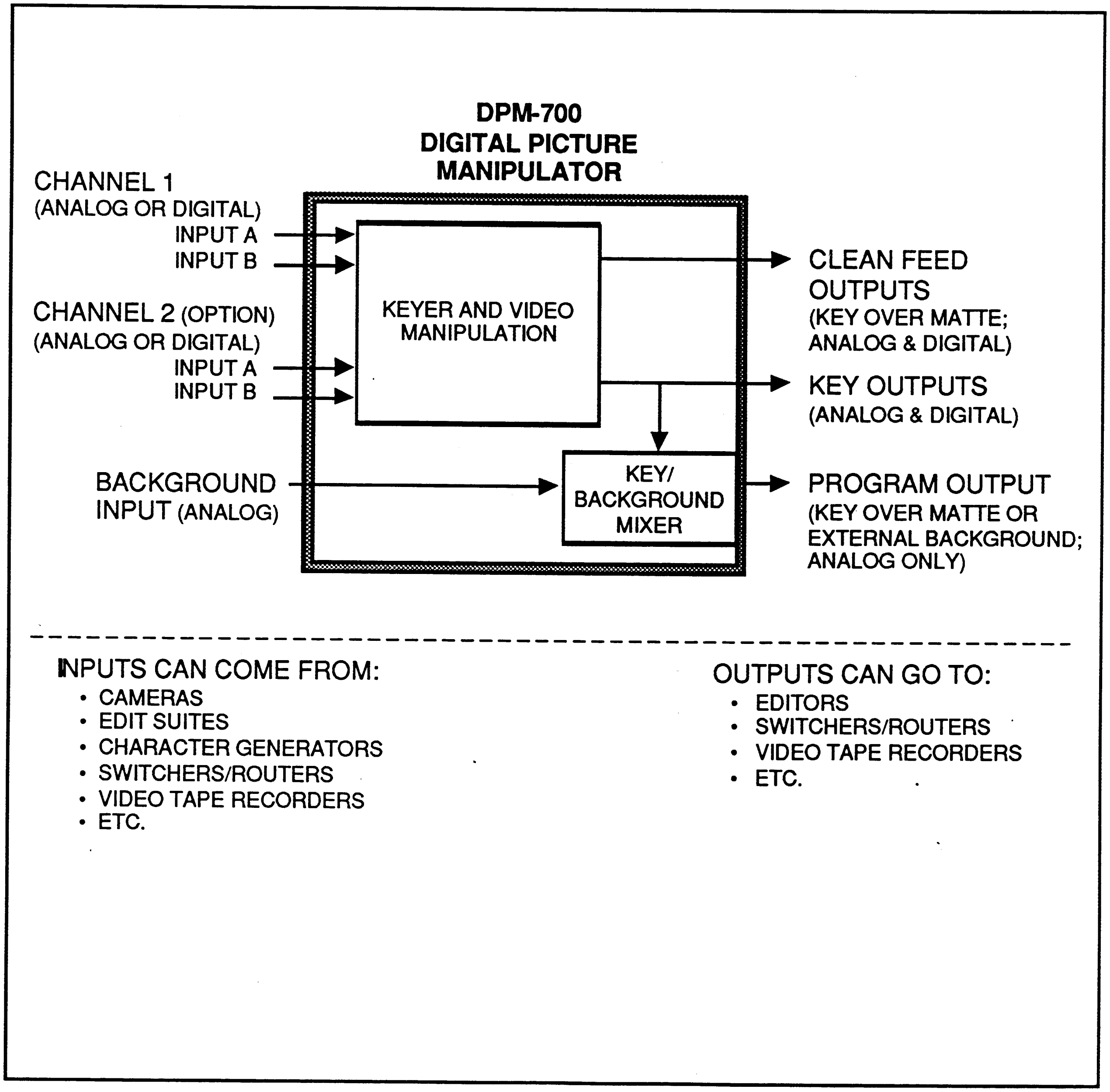

DPM-700
DIGITAL PICTURE
MANIPULATOR
CHANNEL 1
(ANALOG OR DIGITAL)
INPUT A
INPUT B
CHANNEL 2 (OPTION)
(ANALOG OR DIGITAL)
INPUT A
INPUT B
BACKGROUND
INPUT (ANALOG)
KEYER AND VIDEO
MANIPULATION
KEY/
BACKGROUND
MIXER
CLEAN FEED
OUTPUTS
(KEY OVER MATTE;
ANALOG & DIGITAL)
KEY OUTPUTS
(ANALOG & DIGITAL)
PROGRAM OUTPUT
(KEY OVER MATTE OR
EXTERNAL BACKGROUND;
ANALOG ONLY)
INPUTS CAN COME FROM:
• CAMERAS
• EDIT SUITES
• CHARACTER GENERATORS
• SWITCHERS/ROUTERS
• VIDEO TAPE RECORDERS
• ETC.
OUTPUTS CAN GO TO:
• EDITORS
• SWITCHERS/ROUTERS
• VIDEO TAPE RECORDERS
• ETC.

Figure 1-1. System Configuration

Transform and Self Keys

A "key" signal is a type of video signal which can be placed in front of a different background video scene to create a layered effect. In a sense, the key signal "cuts a hole" in the background and the key video is inserted into the hole, as shown in the picture below.

- "Transform" keys use the entire picture as the key signal.
- "Self" keys use the luminance level of the picture to produce the key signal. A hole will be cut in the background wherever the picture's luminance level is higher than a level set by the operator.

Changing the Picture's Size, Shape, and Location

As noted before, a standard DPM-700 comes with one complete channel, which can handle two separate

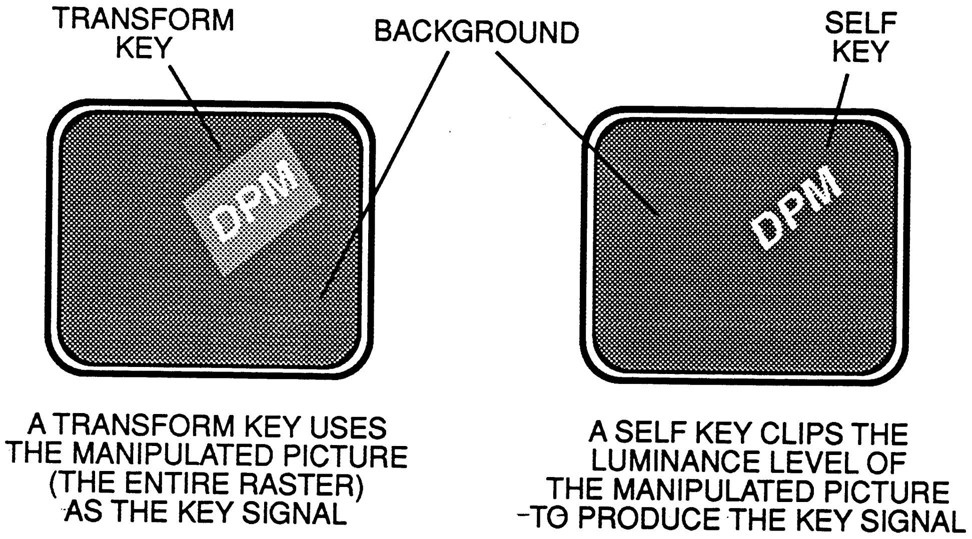

TRANSFORM KEY
BACKGROUND
SELF KEY
DPM
DPM
A TRANSFORM KEY USES THE MANIPULATED PICTURE (THE ENTIRE RASTER) AS THE KEY SIGNAL
A SELF KEY CLIPS THE LUMINANCE LEVEL OF THE MANIPULATED PICTURE TO PRODUCE THE KEY SIGNAL

Figure 1-2. Transform and Luminance Keys

video inputs. You can change from one input to the other during an effect. Possible video manipulations include the following:

- positioning a picture in 3D space anywhere on the screen or entirely off-screen;
- sizing a picture from 0 times to 100 times its original size—X and Y values can be adjusted separately to change the picture's aspect;
- changing the picture's shape by slanting or skewing it;
- rotating a picture to any position around the X, Y, and/or Z axes;
- programming a picture for multiple spins around a variable center in any direction.

If you have a second channel, the possibilities are multiplied. The second channel does everything the first one does. In addition, it allows you to create effects which combine the two channels in layers.

Creating Motion Paths

You can program a complex motion path (called an "effect") by creating and storing a sequence of individual pictures or *key frames*. A key frame is a picture—one frame—defined at a particular point in time according to all possible picture parameters: position, size, sources, borders, etc.

Once you have entered a sequence of key frames, the DPM-700 will do the rest of the work for you by automatically calculating parameters for the picture at all points between key frames. These parameters control what happens to the video image and how it looks as it moves from one key frame to the next in the sequence. For example, if a picture is located in the center of the screen for Key Frame #1 and at the bottom of the screen for Key Frame #2, the DPM-700 will fill in the inbetween points to calculate a natural-looking motion path for you. The motion path can include spins, rotations, and other complex patterns of movement.

You can even program other manipulations to take place during the motion path effect. For example, the picture can change size or shape as it moves along the path. As with motion effects, the DPM-700 will calculate parameters for all points between key frames so that any changes in the picture appear to take place naturally.

Video Output Signals

After manipulation and motion programming, the video signal is fed to three output destinations as follows:

1) The KEY output is a black-and-white signal consisting of the white key shape inserted into a black background. It is available in both analog and digital form.
2) The CLEAN FEED output is a color signal consisting of the keyed video signal inserted into a black or matte background. It is available in both analog and digital form.
3) The PROGRAM output is similar to the CLEAN FEED output. It consists of the same keyed video signal, but it can be inserted into either the matte or an external analog background. The picture cursors for Channel 1, Channel 2, and Global can be displayed on this output and it can be faded to black.

These outputs can be recorded or entered into another video device. Since the DPM-700 Digital Picture Manipulator can be ordered in four different television standards, each with analog and/or digital inputs, it is compatible with most system configurations.

DPM-700 Functions and Features

Since every video production system is different, the DPM-700 has been designed for maximum flexibility so that it will function well in *your* system. It offers the most complete range of standard and optional features of any digital effects manipulator in its class.

DPM-700 Quick Reference Feature Checklist

- Available in Most Television Standards Without External Transcoding
- Choice of Analog and/or Digital Inputs
- Multiple-Motion Keyframing
- Rotation to Any Position Around the X, Y, and/or Z Axes PLUS Spin Around a Variable Center
- STREAMLINE™ Effects Controller
- Luminance/Linear Self Keys
- Powerful Transition Capabilities
- Standard E-MEM® Effects Memory System
- Effect Dissolve
- Disk Drive System
- Extensive Serial, Peripheral, and General Purpose Interface
- Simple and Flexible Timing System

- Works in KeyLayer™ Mode With Any Switcher
- Works in KeyLink™ Mode With a Model 110/110CV Switcher
- Soft Border Generation
- Compact Size
- Built-in Diagnostics and Test Signal Generation
- Reliability and Ease of Maintenance
- Optional Second Channel With Priority Dissolve Combiner
- Optional Recursive Memory With Montage and Trail Effects
- Optional External 10 x 1 Input Selector Which Can Be Fully Controlled By the DPM-700

Standard Features

Television Standards: You can order your DPM-700 already configured for either NTSC, PAL, Component 525, or Component 625 formats, making it easy to match your input standards. This flexibility means you won't need to add input and output transcoders to your system.

Analog/Digital Inputs and Outputs: All of the television systems—PAL, NTSC, 525-line and 625-line—can have either analog or digital inputs. You can mix input types in a two-channel system by using a different format on each channel. Internal digital decoders provide quality 4:2:2 processing. And all systems provide analog Key, Clean Feed, and Program outputs and digital Key and Clean Feed outputs.

Multiple-Motion Keyframing: You can program motion paths using key frames and then adjust the paths in very fine detail. Motion paths between key frames can be made to change instantaneously, at constant rates of speed, or at variable rates of speed. In fact, you can even select different parameters to change in different ways, all in one operation: for example, skew could be made to change at a constant rate of speed while location changes instantaneously. The DPM-700 does all of the calculations for you.

Rotation and Spin: The DPM-700 takes full advantage of 3D space. You can rotate each picture to any position around its X, Y, or Z axis and then set it spinning around a different, variable axis point at the same time. The separate, global X, Y, and Z axes allow you to add still another layer of rotation to create exciting transition effects and motion paths.

STREAMLINE™ Effects Controller System: Every DPM-700 comes with a STREAMLINE™ Effects Controller and Disk Storage System. This system is similar in operation to a computer. The system's display screen shows menus for different software programs which can be accessed and run. There are programs for controlling special video effects such as borders, mosaics, posterization and many others. In addition, the Effects Controller allows you to adjust setup and personality parameters to customize your system and to run built-in diagnostic programs.

Luminance/Linear Self Keys: The DPM-700 has a standard luminance keyer built-in; you don't have to tie up a keyer in your switcher in order to key the picture over an internal matte background or over external background video. This simplifies system hook-ups, as well as adding an extra level of keying power.

Powerful Transition Capabilities: You can change from one output video to another in a variety of ways, while maintaining complete control over your effect, using the DPM-700's versatile transition effects. Cut, automatic, and manual (lever arm) transitions are available for key frame transitions, keyer transitions, Combiner (two-channel) transitions, and fade-to-black transitions.

E-MEM® Effects Memory System: The E-MEM® system gives you immediate and accurate storage and recall of key frame effects. Each effect can be up to 150 key frames in size per channel; the E-MEM® system can hold a total of 600 key frames.

Effect Dissolve: The DPM-700's Effect Dissolve function lets you delay the start of an effect when you run it so that you can change gradually to the first key frame over a period of time instead of snapping to it abruptly. That is, instead of going immediately to the first key frame of the effect, the DPM-700 will "dissolve" or change gradually from its existing state to the state of the first key frame, using whatever rate is set for the Effect Dissolve function. This rate can be from 0 seconds (a cut) to 999,999 seconds. You can use Effect Dissolve whenever you run an effect, whether it's in the current effect space or stored in an E-MEM® register.

Built-in Disk Drive for Extra, Non-Volatile Storage: Your DPM-700 includes a standard disk storage system which you can use to store and recall E-MEM® effects and system setup, timing and personality settings. The system comes with a diskette which contains a number of pre-programmed effects for you to choose from, either to run as they are or to edit to create new effects. The disk drive is also used for loading system operating software and performing some diagnostic functions. Because the disk drive is actually part of the control panel, it is always right there for you to use.

Extensive Serial, Peripheral, and General Purpose Interface (GPI): The DPM-700 system includes ports for control of external input selectors, Horizon routers, Model 100/110 switchers, Model 200 switchers and outgoing GPI signals, as well as for interface with edit controllers and for incoming GPIs. This means maximum flexibility and minimum complications when you're connecting a DPM-700 into your system.

Convenient Size: The DPM-700's electronics frame is compact enough to fit into even small operation sites, such as remote and mobile applications.

Flexible Timing System: Each input channel to your DPM-700 can be independently timed. The timing of the DPM-700's output (transformed images) can be adjusted with respect to the house reference. You can even store different output timing values and switch between them quickly and easily whenever you need to.

KeyLayer™ Upstream/Downstream Operation: The DPM-700's flexible timing system is particularly valuable when you're operating your DPM-700 with a switcher: you can use one time setting to send transformed pictures to the switcher for "upstream" manipulation; then, instead of recabling, you can switch to another setting which has been timed to the output of the switcher for "downstream" operation. For details and diagrams, refer to the "KeyLayer™ Operation" heading in Section 2 of the DPM-700 Service Manual.

KeyLink™ Mode Operation: Grass Valley Group's Model 110 Production Switcher has a special KeyLink™ feature which allows an external key or a chroma key from the Model 110 to be sent out to a digital picture manipulator for transformation. The transformed video is then returned to the Model 110, where it can be keyed in over the Program or Preset background and have a downstream key added. The DPM-700's software has been designed to operate closely with KeyLink™ by performing much of the setup for you automatically, with a single press of a pushbutton.

Background/Soft Border Generation: The DPM-700 has built-in matte generators for background and border colors. Border adjustment is very flexible: you can change the width of any or all edges and can adjust the border softness.

Test Signal Generation and Diagnostics: The DPM-700 is designed to make alignment and troubleshooting easy. Internally-generated test signals and built-in diagnostic programs verify optimum system performance and reduce down time if a problem should occur.

Reliability and Ease of Maintenance: The DPM-700 is designed with a minimum of adjustments to keep maintenance requirements low. It uses Grass Valley Group parts and designs for superior performance and durability.

Key Channel or Second Video Channel Capability: You can easily install a second channel to double the video processing abilities of the system, and more than double the creative power. The second channel is identical to the first and can be separately controlled, but its real strength lies in using the two in combination. The Second Channel Combiner function allows you to dissolve between channels and change which one appears in front; this makes it appear that one picture is passing through the other. You can also create fascinating shadow effects by using one channel as a shadow for the other, and either channel can fly a key signal with a video signal from the other channel.

Options

Second Channel: The Second Channel option provides a full second channel for video processing, more than doubling the power of a one-channel DPM-700. You can use the second channel for dedicated key processing or to combine and manipulate video in layers to create any number of imaginative effects. The Second Channel option consists of a second Digital Video Processor Module, a Combiner Submodule, and a second Input Submodule. The Input Submodule can be selected in either analog or digital format.

Recursive Memory: The Recursive Memory adds a full frame of memory to the system, giving you the ability to do montages, trails and decays. This option is a submodule which installs on the Control Processor Module in the electronics frame.

External 10 x 1 Input Selector (one per channel): A 10 x 1 analog input selector with looping inputs is available for both composite and component versions of the DPM-700. It is controlled from the DPM-700 control panel. This option eliminates the need for manual external routing to the DPM-700's built-in inputs. It also allows precise "on edge" switching between up to ten different input sources.

Disk Remote Kit: You will need this option if you are going to obstruct access to the disk drive located in the left side of the panel, perhaps by placing another piece of equipment there. The Disk Remote option allows you to remove the disk drive and mount it outside the control panel. The option consists of a one-rack-unit high, rack-mountable housing; a six-foot shielded extension cable; two cable adapter sets; and a connector bracket to close up the disk-drive hole in the control panel. If you are going to install your control panel in a rack or drop it into a console, order the Rack Mounting Kit option, which includes a Disk Remote Kit.

Control Panel Rack Mount Adapter: This option allows you to mount the DPM-700 control panel in a standard 19" equipment rack. Mounting the panel requires eight rack units of space (14"). The mounting hardware allows you to adjust the tilt and height of the panel in the rack. Because mounting the panel in a rack may block access to the disk drive, the Rack Mount option includes a Disk Remote Kit.

Spare Service Manual Set: This option includes one complete two-volume set of Service Manuals (the DPM-700 is shipped with one set). The Service Manuals describe the options as well as the standard system.

Spare Operator's Handbook: This option consists of a spare copy of the DPM-700 Operator's Handbook, which describes all system operations and includes tutorials and quick-reference materials. (The DPM-700 is shipped with one copy of the Handbook.)

Extender Board Set: This option includes two module extender boards: one extender is for digital modules and the other is for analog modules.

NOTE: Extender boards are not included with the standard system. We suggest that you purchase an extender set if you plan to service your own DPM-700 system.

Spare Power Supply: This option provides one complete power supply. The DPM-700 can be connected to only one power supply at a time, so this option is a spare, not a redundant, power supply.

Spare Module Kit, Analog or Digital: The Spare Module Kits include a set of the system-level modules which are most useful for emergency replacements and for troubleshooting. The kits do not include options. Be sure to order the version which matches your basic DPM-700 system (specify analog PAL, analog NTSC, analog Component 525, analog Component 625, digital PAL, digital NTSC, digital Component 525, or digital Component 625).

Spare Parts Kit: The Spare Parts Kits contain hybrids, PLDs, custom ASICs, etc., for component-level repair of the control panel and frame. Common parts such as resistors and capacitors are not included. Be sure to order the version which matches your basic DPM-700 system (specify NTSC, PAL, Component 525, or Component 625; all spare parts kits are suitable for both analog and digital input format systems).

Physical Configuration

The DPM-700 consists of a control panel and an electronics frame. They are connected by a single 15-conductor, full-duplex serial communications control cable which also provides power to the panel. This cable can be up to 100 meters long.

The control panel is designed to be used on a desk or console top. The panel contains a disk drive located in its left side, so you should leave room for inserting and removing disks. If desired, you can use the optional Rack Mount Adapter Kit to install the panel in a standard 19-inch equipment rack or drop it into a console. Since this may block access to the disk drive, the Adapter Kit includes a Disk Remote Kit which lets you remove the disk drive and mount it outside the control panel.

The DPM-700 electronics frame is four rack units high (6.96 inches/17.68 cm) and mounts in a standard 19-inch-wide (48.3 cm) equipment rack. The frame contains three standard electronics modules: a Control Processor Module, a Digital Video Processor Module, and an Interface Module. There is also a slot for a second Digital Video Processor Module for the optional second channel.

The power supply for the DPM-700 frame and the control panel is located in the frame on the left side. There is an on/off switch for the power supply at the front of the frame. The same area holds fans which provide cooling for the unit. Input voltage for the supply is user-selectable and can be either 90-132 volts or 180-264 volts at 50/60 Hz.

SPECIFICATIONS

Specifications listed on the following pages for the DPM-700 Digital Picture Manipulator are measured according to the procedures published in Grass Valley Group's Comprehensive Video Test Methods. All specifications are subject to change without notice. Specifications are based on unity composite NTSC analog video in and out.

Inputs

Video (Switched A/B Inputs For Each Channel) (Looping Inputs on All Analog Formats)	NTSC Composite Analog PAL Composite Analog NTSC D-2 Composite Digital PAL D-2 Composite Digital
External Background Video	Non-Differential, High-Impedance Analog Looping Input; Allows Timed Video Input for Keyer Background
Timing Reference Video	Color Black or Color Bars (40 IRE Units, Sync and Burst)

Input Characteristics

Input Video Level	1.0 Vpp Composite, Including Sync and/or Setup
Input Impedance	
Video	75 ohm Looping
Reference	75 ohm Looping
Key	75 ohm Looping
Background	75 ohm Looping
Return Loss	≥40 dB, 15 KHz to 5 MHz
Input Timing Range	
Input 1	20 µS Delay to 35 µS Advance, relative to Timing Reference
Input 2	20 µS Delay to 35 µS Advance, relative to Timing Reference

Outputs

Video	Same as Input Formats, Plus Each System Outputs in Both Analog and Digital Modes
Key	Full Bandwidth Key Output
Clean Feed	Same as Input Format (Prior to Internal Keyer)
DC on Output Blanking Level	±50 mV

Output Characteristics

Output Timing Range	90 µS Delay to 162 µS Advance relative to Timing Reference
Frequency Response	
Luminance Channel	-0.25 dB, 300 KHz to 5 MHz
Signal to Noise Ratio (Unweighted)	
Excluding Quant.	>58 dB Signal-to-RMS Noise
Inlcuding Quant.	>44 dB Signal-to RMS Noise
Crosstalk (Deselected Input to Program Output)	<-54 dB, DC to 4.43 MHz
K Ratings	
K Pulse	<2%
K Bar	<2%
K Pulse/Bar	<2%
Field Rate Tilt	<2%
Chrominance/Luminance Inequalities	
Gain	<0.2 dB
Delay	<10 nS
Non-linear Distortion (10-90% APL)	
Differential Phase	<2 degrees
Differential Gain	<2%
Output Conditions	
Output Impedance	75 ohms
Return Loss	>34 dB, 15 KHz to 5 Mhz
Isolation	>34 dB, 15 KHz to 5 Mhz
SC/H Phase Error	0 ± 5 degree
Horizontal Jitter	<3.0 nS Relative to Timing Reference
Blanking Timing	
Start of H Blanking	Adjustable 1.5 µS ±1.5 µS Delay/Advance Relative to Leading Edge of Sync
End of H Blanking	NTSC: Adjustable 9.4 µS ±1.5 µS Delay/Advance Relative to Leading Edge of Sync PAL: Adjustable 10.5 µS ±1.5µS Delay/Advance Relative to Leading Edge of Sync
Timing Delay Match	
Clean Feed to Key Out	-0 nS ± 10nS
External Background Input to Program Output	52 nS advanced ± 10nS

Power Specifications

Input Power	Selectable: 90 - 130 Vac, 200 - 260 Vac, 50 or 60 Hz
Power Consumption	225 VA Maximum

Environmental Characteristics

Temperature Range	
Specification	20° to 30° C (68 to 86° F) with 60 minute warmup
Operational	0 to 40° C (32 to 104° F)
Relative Humidity	Up to 90% (non-condensing)

Physical Specifications

Control Panel	
Height	5.2 inches/13.3 centimeters
Width	17.0 inches/43.2 centimeters
Depth	13.75 inches/35.0 centimeters
Weight	15 lbs.
Frame (fully optioned)	
Height	4 RU (6.96 inches/17.68 centimeters)
Weight	60 lbs.

Section 2
Installation

INTRODUCTION

This section provides step-by-step instructions explaining how to completely install the DPM-700 Digital Picture Manipulator and its options, make connections to it, and set it up for operation using the built-in software setup features. Main topics covered in this section are listed in order below:

- Safety Precautions
- Unpacking
- Standard Installation
- Option Installation
- Interfaces (GPI, Serial, TTY, etc.)
- Typical Configurations

SAFETY PRECAUTIONS

Please read these precautions thoroughly before doing anything with the DPM-700. They are meant to protect you and your DPM-700.

Warnings and cautions in the manual: The two symbols below are used throughout this manual to call your attention to special concerns. "Warnings" alert you to risks to human life. "Cautions" alert you to risks to equipment and/or software.

WARNING

CAUTION

Lethal electricity exists inside the frame unit. To prevent death or injury from electric shock, do not remove protective cover plate over power supply compartment. Refer to qualified service personnel.

Correct power and fuses: The equipment may be damaged if you do not select the correct ac input voltage and fuses before applying power. Refer to the instructions later in this section under the heading "Selecting the AC Line Voltage and AC Fuse".

Correct ground: To prevent electric shock hazards, be sure to provide a proper earth ground connection to the equipment via the center conductor of the ac line cord.

Rain or moisture can cause component damage or electrical shorts. Protect the unit from moisture.

Protect cables so they are not likely to be damaged.

Cleaning: Unplug unit before cleaning. Do not use liquid or aerosol cleaners as they can cause internal and external damage to the unit. Use only a damp cloth.

Contact qualified service personnel if:

- Power cord or plug is damaged
- Liquid or objects have gotten inside the unit
- Unit has been dropped or damaged
- Performance changes significantly

Replacement parts: Use only those specified replacement parts.

Static electricity damage: This unit contains components which are vulnerable to static electricity discharge. Wear a grounding strap to prevent static discharge when handling the equipment.

To prevent damage from electrical arcing to circuitry and connectors, be sure to turn off the main power switch on the unit before connecting or disconnecting cables and before removing or inserting modules.

Equipment Overheating: The frame is cooled by two internal fans. Ensure that the fans operate and that air flow is not blocked, otherwise heat damage to the system can occur. The control panel requires no special cooling.

Save all safety and operating instructions for future reference.

UNPACKING

Your DPM-700 system is packaged in several different boxes: one each for the electronics frame, control panel, cables and manuals, and one for each option (unless pre-installed).

Please check the packing slip to be sure you have received what you ordered. It's always a good idea to inventory the boxes before beginning actual installation.

You may want to save the shipping boxes and packing material, in the unlikely event that you should need to ship the unit for service.

As you begin unpacking and getting familiar with the equipment, you may want to gain an understanding of the GVG model numbering and part numbering systems. These are explained in the Parts Lists section of this manual.

STANDARD INSTALLATION

This subsection will enable you to completely install, cable, power-up, and perform a quick operational checkout for the standard DPM-700 system. Option installation is covered in the subsection immediately following this one.

System Components

The standard DPM-700 system shown in Figure 2-1 consists of three main pieces: a control panel, an electronics frame with ac line cord, and a single frame-to-panel control cable, which also provides power to the panel.

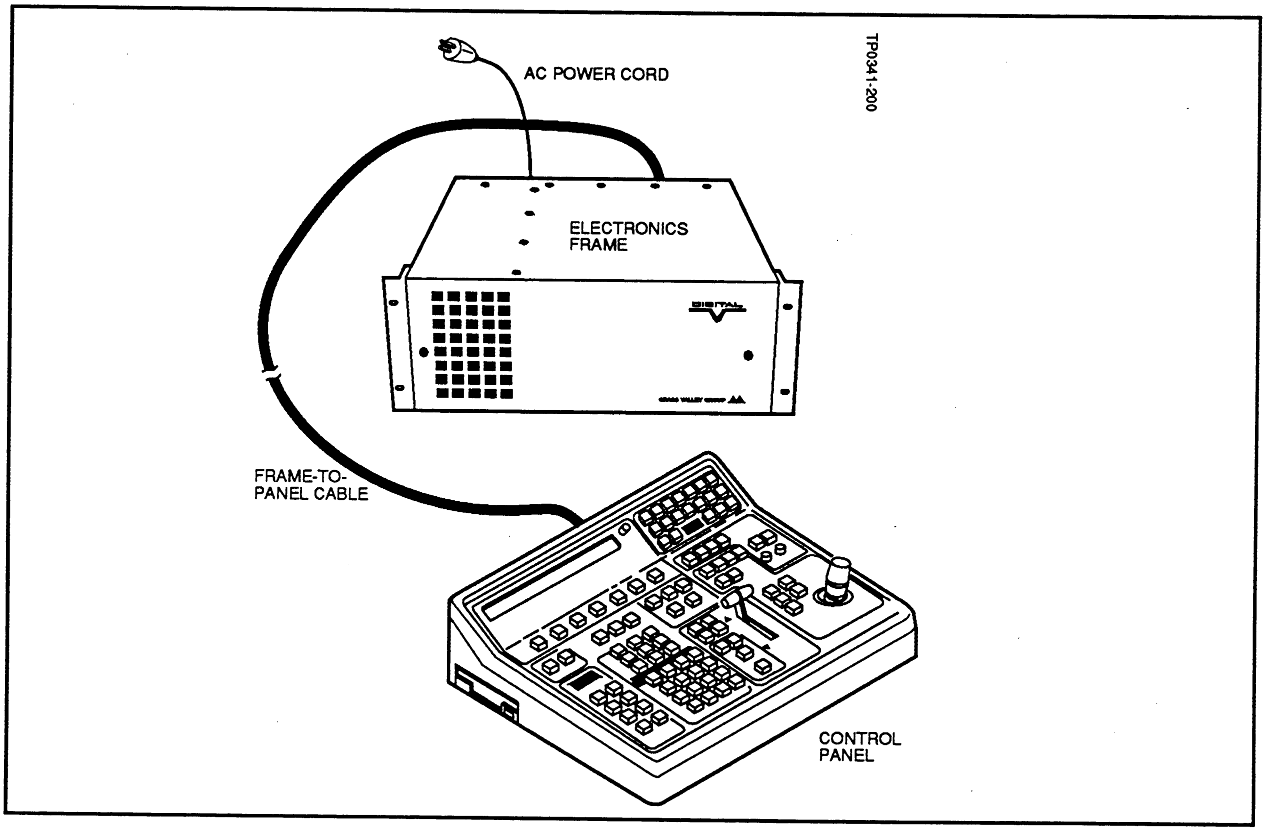

AC POWER CORD
TP0341-200
ELECTRONICS FRAME
FRAME-TO-PANEL CABLE
CONTROL PANEL

Figure 2-1. Control Panel, Frame, and Cables

Control Panel Installation

Placement and Mounting of the Panel

In the standard system, the control panel is designed to be used on a desk, counter top, or console. It can be left free-standing or bolted down as shown below in Figure 2-2, along with the panel's overall dimensions. When positioning the panel, be sure to leave adequate clearance for access to the disk drive on the left side.

Optionally, you can install the panel in a standard 19-inch equipment rack, or you can drop it into a console. Both cases require use of the optional Control Panel Rack-Mount Kit. And, in either case, you will have to remote the disk drive in a standard 19-inch rack using the disk drive's own optional rack-mount kit. Please see the Option Installation subsection for details.

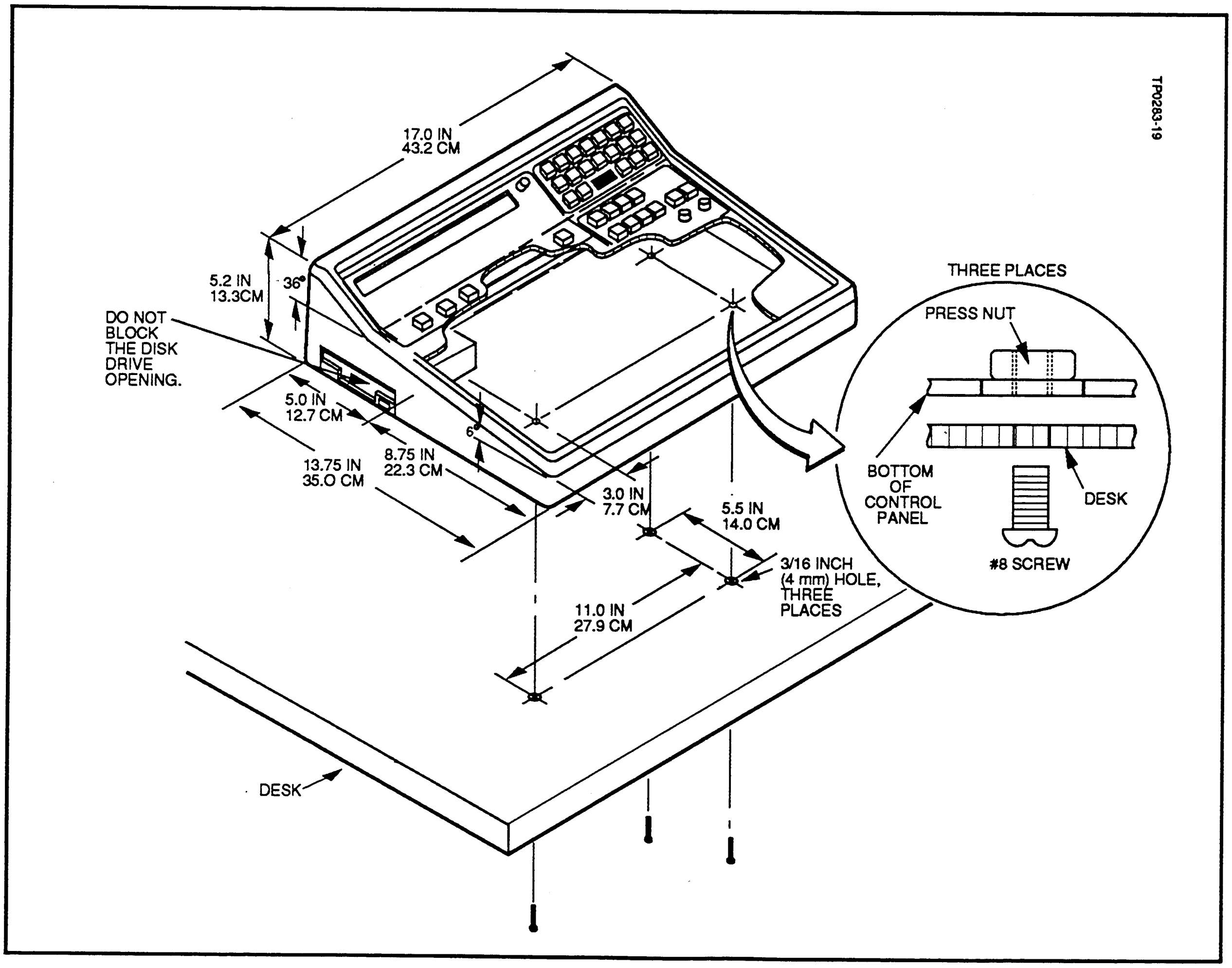

17.0 IN
43.2 CM
5.2 IN
13.3CM
36°
DO NOT BLOCK THE DISK DRIVE OPENING.
5.0 IN
12.7 CM
6°
13.75 IN
35.0 CM
8.75 IN
22.3 CM
3.0 IN
7.7 CM
5.5 IN
14.0 CM
3/16 INCH (4 mm) HOLE, THREE PLACES
11.0 IN
27.9 CM
DESK
THREE PLACES
PRESS NUT
BOTTOM OF CONTROL PANEL
DESK
#8 SCREW
TP0283-19

Figure 2-2. Control Panel Dimensions and Countertop Mounting

Panel Connections

There are two connectors on the rear of the panel as shown below in Figure 2-3, the one on the left is for a TTY Diagnostics Terminal, and the one on the right is for the control cable from the electronics frame (explained later under "Cabling"). No matter which method you use for mounting the panel, be sure to leave adequate clearance (we recommend at least 3 inches) for the cables.

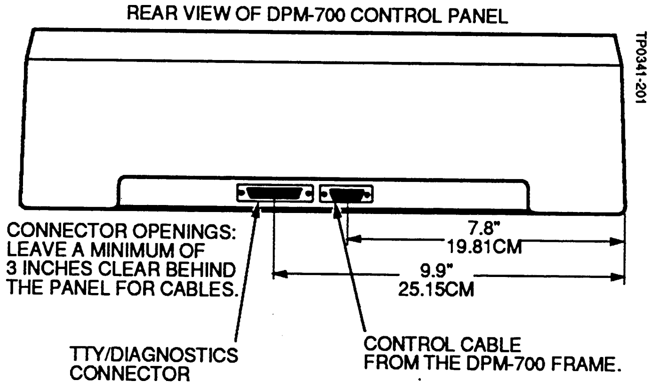

REAR VIEW OF DPM-700 CONTROL PANEL
TP0341-201
CONNECTOR OPENINGS: LEAVE A MINIMUM OF 3 INCHES CLEAR BEHIND THE PANEL FOR CABLES.
7.8"
19.81CM
9.9"
25.15CM
TTY/DIAGNOSTICS CONNECTOR
CONTROL CABLE FROM THE DPM-700 FRAME.

Figure 2-3. Control Panel Connectors and Dimensions (Rear View)

Electronics Frame Installation

WARNINGS

1. Lethal (deadly) levels of electricity exist inside the frame. Refer to qualified service personnel. Properly following these installation instructions will greatly help to prevent defeat of the internal safety mechanisms within the frame which guard against electrical shock.

2. The frame weighs about 29kilograms / 64 pounds. Be careful of your back when lifting it, and be careful not to drop it, as serious injury to you and / or damage to the frame can result.

CAUTIONS

1. To prevent damage to the power supply, be sure to set the ac input voltage selector and fuse to match your house electrical circuit.

2. To prevent equipment damage from overheating, carefully follow all instructions relating to frame cooling.

3. To avoid circuit damage from static electricity discharge, carefully follow all anti-static instructions before touching any frame modules.

Main Parts of the Frame

The electronics frame shown in Figure 2-4 contains the electronics modules, a pair of motherboards (the exterior one is the backplane where all external ac power, signal, and control connections are made), the main power supply with its on/off switch and dc fuses, and a cooling system. The cooling system consists of the intake air vents and air filter shown on the front cover, two fans in the power supply compartment, and the exhaust air vents on the right side of the frame. Do not obstruct the cooling vents in any way or damage from overheating can occur.

Rack Mounting the Electronics Frame

The electronics frame is Four rack-units high (6.96 inches/17.68 cm.) and mounts in a standard 19-inch wide (48.3 cm.) equipment rack. Figure 2-4 shows the frame, its dimensions, and rack-mounting hardware. To mount the frame in a rack, leave the ac line cord disconnected, and proceed as follows:

1. Plan the mounting location for the frame in your rack. Leave one rack-unit of space above and below the frame to prevent overheating, and be sure not to obstruct the air vents on the right side.

2. Locate and remove the two rear support brackets from both sides of the frame, keeping track of which side each bracket comes off of. Do not mix them up. For safe shipping, each bracket is screwed to its adjustable rear support plate. Replace but do not tighten the screws.

3. Before mounting the frame, measure the depth of the rack. Then screw the rear support plates firmly to the sides of the frame so that they will extend about 1/2" (2 cm.) past the rear rack rails when the frame is installed.

4. Screw the rear support brackets firmly to the rear rack rails. Note that the slot in the brackets is biased to the top of the bracket. When the brackets and frame are properly installed, the mounting holes in the brackets will exactly line up horizontally with the mounting holes in the frame's rack ears.

5. Lift the frame into position in the rack and insert the rear support plates into the slots in the rear support brackets. Then screw the frame's rack ears to the front rack rails.

This completes the rack mounting procedure.

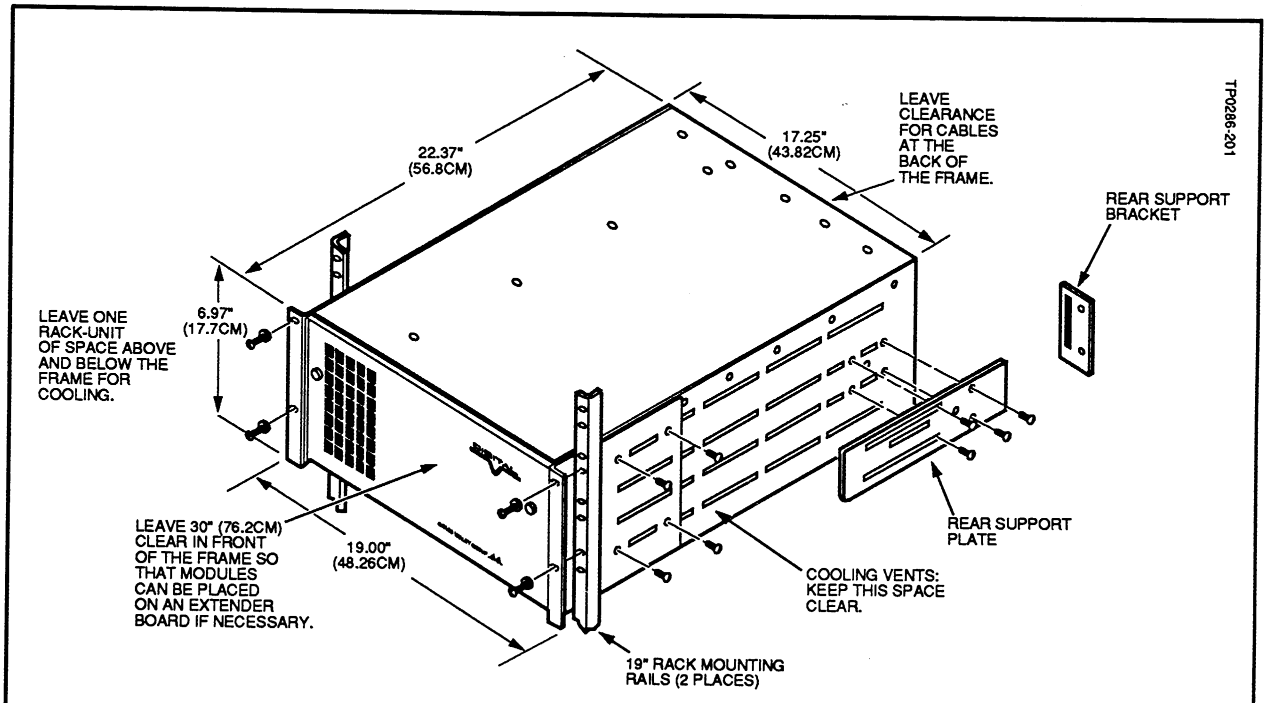

22.37"
(56.8CM)
17.25"
(43.82CM)
LEAVE CLEARANCE FOR CABLES AT THE BACK OF THE FRAME.
TP0286-201
REAR SUPPORT BRACKET
LEAVE ONE RACK-UNIT OF SPACE ABOVE AND BELOW THE FRAME FOR COOLING.
6.97"
(17.7CM)
LEAVE 30" (76.2CM) CLEAR IN FRONT OF THE FRAME SO THAT MODULES CAN BE PLACED ON AN EXTENDER BOARD IF NECESSARY.
19.00"
(48.26CM)
REAR SUPPORT PLATE
COOLING VENTS: KEEP THIS SPACE CLEAR.
19" RACK MOUNTING RAILS (2 PLACES)

Figure 2-4. The Electronics Frame

Making Sure the Frame Modules Are Seated

It is essential to make sure that the modules did not come loose from their connectors during shipment:

1. Please see Figure 2-5. Remove the front cover of the frame by turning each of the two twist-lock knobs until each catch comes loose (turn the knobs about 1/4 turn). This will expose the electronics modules, power switch, and dc fuses.

2. Discharge any static electricity from your body by touching the metal outer casing of the frame before touching any modules. Ideally, you should wear an anti-static grounding strap.

CAUTIONS

(1) The frame's modules are highly vulnerable to static electricity discharge. To protect them from damage, carefully follow the precautionary measures given above.

(2) Do not insert or remove any modules with the power on, or damage to the circuits or connectors may result.

3. Be sure system power is off.

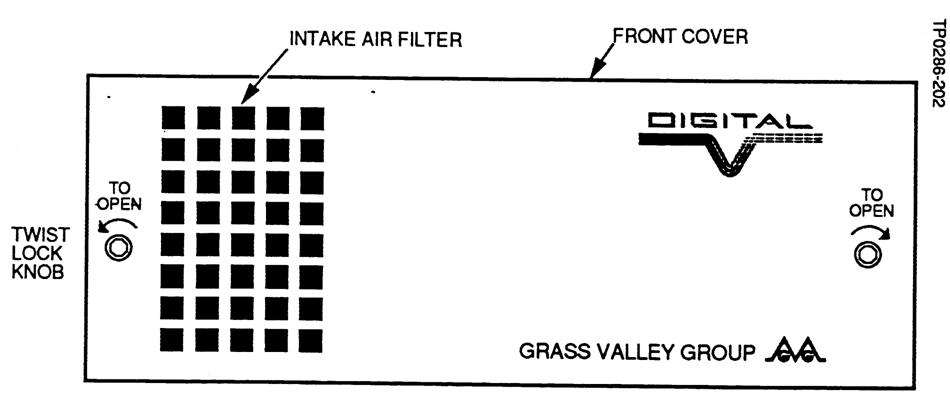


Figure 2-5. Front Cover of the Electronics Frame

4. Loosen the screws holding the Module Restrict Bar and slide the bar to the left. The bar is located just to the right of the on/off switch and fuses (see Figure 2-6).

   The Module Restrict Bar is designed primarily to remind you always to turn the power off before removing or inserting modules. Note its cautionary sticker. The restrict bar also helps to keep the modules firmly in place. Do not permanently remove the restrict bar after installation and/or maintenance.

5. Ensure that each module is seated well in its connectors on the interior motherboard by pressing firmly in towards the rear of the frame on each module. Each module should appear square with the front edge of the frame and the ejector tabs should be flat against the modules.

6. Slide the Module Restrict Bar to the right so that it blocks removal of the modules, and tighten the screws.

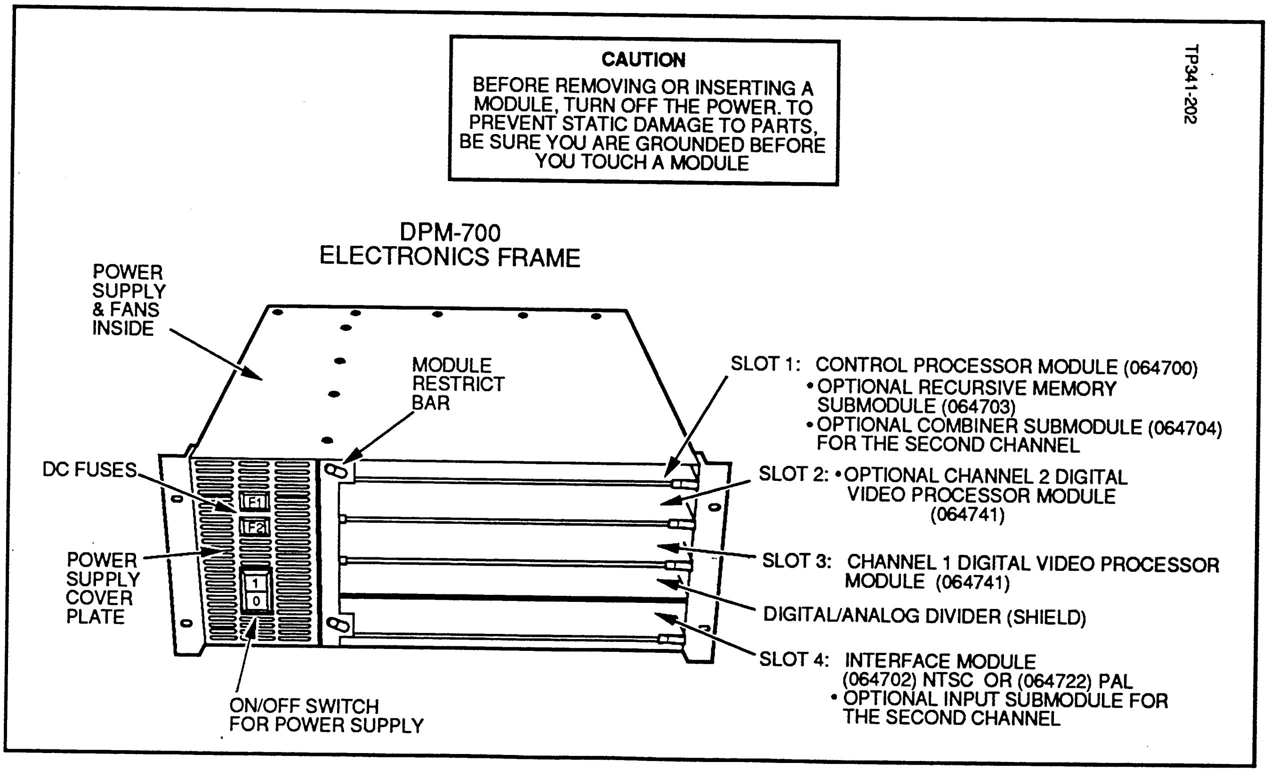

CAUTION
BEFORE REMOVING OR INSERTING A MODULE, TURN OFF THE POWER. TO PREVENT STATIC DAMAGE TO PARTS, BE SURE YOU ARE GROUNDED BEFORE YOU TOUCH A MODULE
TP341-202
DPM-700 ELECTRONICS FRAME
POWER SUPPLY & FANS INSIDE
MODULE RESTRICT BAR
DC FUSES
F1
F2
1
0
POWER SUPPLY COVER PLATE
ON/OFF SWITCH FOR POWER SUPPLY
SLOT 1: CONTROL PROCESSOR MODULE (064700)
• OPTIONAL RECURSIVE MEMORY SUBMODULE (064703)
• OPTIONAL COMBINER SUBMODULE (064704) FOR THE SECOND CHANNEL
SLOT 2: • OPTIONAL CHANNEL 2 DIGITAL VIDEO PROCESSOR MODULE (064741)
SLOT 3: CHANNEL 1 DIGITAL VIDEO PROCESSOR MODULE (064741)
DIGITAL/ANALOG DIVIDER (SHIELD)
SLOT 4: INTERFACE MODULE (064702) NTSC OR (064722) PAL
• OPTIONAL INPUT SUBMODULE FOR THE SECOND CHANNEL

Figure 2-6. Locations of Modules in the Frame

Checking the Frame's DC Fuses

1. Locate the two dc fuses on the power supply protective cover plate. These fuses protect the power supply and power distribution paths. The top fuse is for the -12 Vdc bus and the bottom fuse is for the +24 Vdc bus.

2. Remove each fuse from its tray by pressing firmly in on the cover with your finger to the end stop, and then releasing smoothly. Check the rating of the fuse, and that it is not blown or the glass cracked. Both fuses should be 4 amps, 250 volts, fast blow. Replace the fuses if necessary.

3. Reinsert each fuse in its tray, and reinsert each tray into its holder. Lock each fuse assembly back into place by pressing firmly on the front with your finger, compressing the spring to the end stop, and then releasing smoothly.

The Power Supply

The DPM-700's power supply is located in its own compartment behind the power supply cover plate (on/off switch plate) within the electronics frame. The power supply comes pre-installed and ready for operation to provide power to both the frame and the control panel. Power consumption of the supply is less than 225 watts. The supply is cooled by two fans within the power supply compartment. These fans start automatically and remain in continuous operation whenever power is applied to the system.

WARNING

Dangerous voltage exists behind the power supply front cover plate (on / off switch plate). Only qualified technicians should remove it to service the power supply. To prevent injury or death from electric shock, unplug the ac line cord before removing the power supply cover plate.

CABLING

This subsection covers standard cabling:

- Connecting the Frame to Panel Cable
- Connecting the Timing Reference Input
- Connecting the Video Channel Inputs
- Connecting the Background Video Input
- Connecting the Video and Key Outputs
- Selecting the AC Line Voltage and Fuse
- Initial Power-up
- Operational Checkout

Option cabling is covered under Option Installation later in this section. Before cabling, you may want to read KEYLAYER™ OPERATION later in this section for information about simultaneous upstream/ downstream cabling in conjunction with a production switcher.

The BNC connectors on the backplane are inputs or outputs for standard composite video or key signals. BNC inputs are unterminated looping connectors which must be externally terminated in 75 ohms; outputs are separately-driven and self-terminating. The 25-pin D connectors are inputs or outputs for standard D2 digital video. Figure 2-7 gives a pinout for the digital connectors, and Figure 2-8 summarizes the function of each connector on the backplane.

NOTE: *As a general practice, always turn off power to the DPM-700 and associated equipment before connecting or disconnecting cables, especially, digital video cables. This helps protect circuits from damage by momentary connector pin shorts during cable connection.*

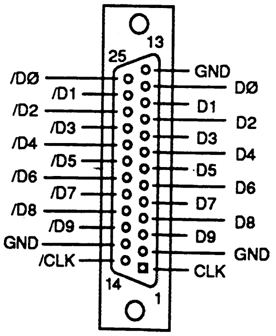
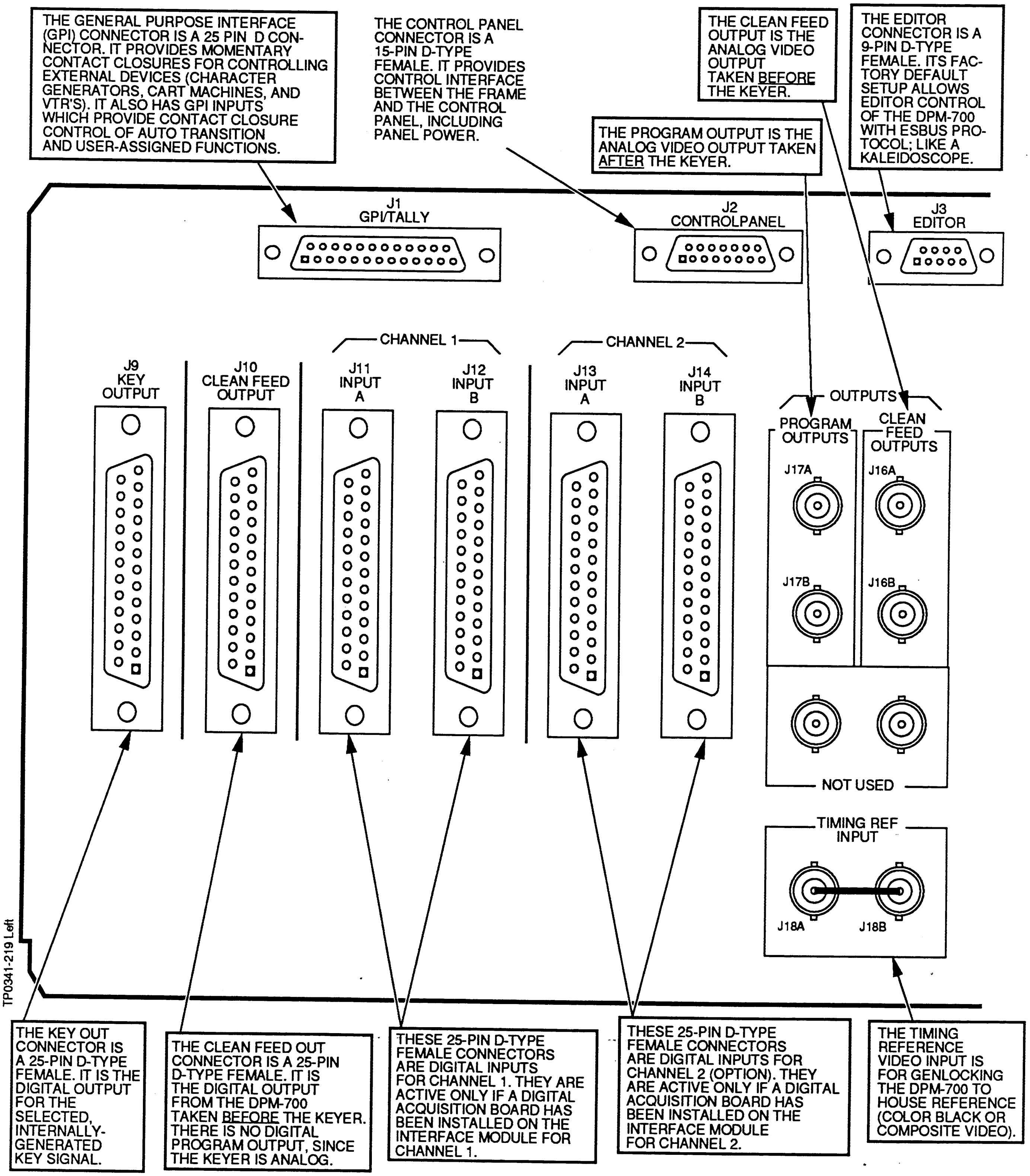


Figure 2-7. 25-pin Digital Connector Pinouts


J1
GPI/TALLY
J2
CONTROLPANEL
J3
EDITOR
CHANNEL 1
CHANNEL 2
J9
KEY
OUTPUT
J10
CLEAN FEED
OUTPUT
J11
INPUT
A
J12
INPUT
B
J13
INPUT
A
J14
INPUT
B
OUTPUTS
PROGRAM
OUTPUTS
CLEAN
FEED
OUTPUTS
J17A
J16A
J17B
J16B
NOT USED
TIMING REF
INPUT
J18A
J18B
TP0341-219 Left

THE GENERAL PURPOSE INTERFACE (GPI) CONNECTOR IS A 25 PIN D CONNECTOR. IT PROVIDES MOMENTARY CONTACT CLOSURES FOR CONTROLLING EXTERNAL DEVICES (CHARACTER GENERATORS, CART MACHINES, AND VTR'S). IT ALSO HAS GPI INPUTS WHICH PROVIDE CONTACT CLOSURE CONTROL OF AUTO TRANSITION AND USER-ASSIGNED FUNCTIONS.

THE CONTROL PANEL CONNECTOR IS A 15-PIN D-TYPE FEMALE. IT PROVIDES CONTROL INTERFACE BETWEEN THE FRAME AND THE CONTROL PANEL, INCLUDING PANEL POWER.

THE CLEAN FEED OUTPUT IS THE ANALOG VIDEO OUTPUT TAKEN BEFORE THE KEYER.

THE EDITOR CONNECTOR IS A 9-PIN D-TYPE FEMALE. ITS FACTORY DEFAULT SETUP ALLOWS EDITOR CONTROL OF THE DPM-700 WITH ESBUS PROTOCOL; LIKE A KALEIDOSCOPE.

THE PROGRAM OUTPUT IS THE ANALOG VIDEO OUTPUT TAKEN AFTER THE KEYER.

THE KEY OUT CONNECTOR IS A 25-PIN D-TYPE FEMALE. IT IS THE DIGITAL OUTPUT FOR THE SELECTED, INTERNALLY-GENERATED KEY SIGNAL.

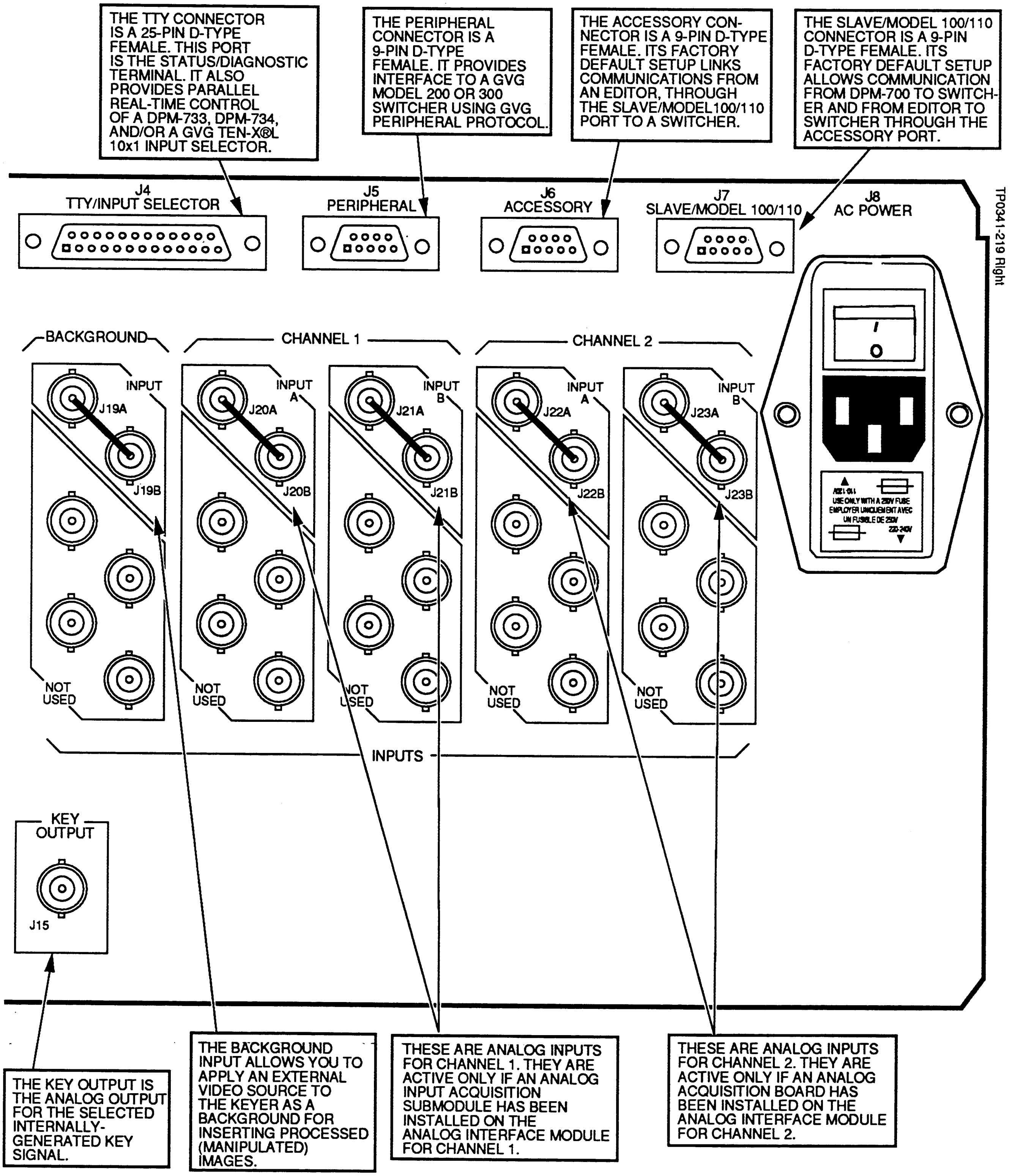
THE CLEAN FEED OUT CONNECTOR IS A 25-PIN D-TYPE FEMALE. IT IS THE DIGITAL OUTPUT FROM THE DPM-700 TAKEN BEFORE THE KEYER. THERE IS NO DIGITAL PROGRAM OUTPUT, SINCE THE KEYER IS ANALOG.

THESE 25-PIN D-TYPE FEMALE CONNECTORS ARE DIGITAL INPUTS FOR CHANNEL 1. THEY ARE ACTIVE ONLY IF A DIGITAL ACQUISITION BOARD HAS BEEN INSTALLED ON THE INTERFACE MODULE FOR CHANNEL 1.

THESE 25-PIN D-TYPE FEMALE CONNECTORS ARE DIGITAL INPUTS FOR CHANNEL 2 (OPTION). THEY ARE ACTIVE ONLY IF A DIGITAL ACQUISITION BOARD HAS BEEN INSTALLED ON THE INTERFACE MODULE FOR CHANNEL 2.

THE TIMING REFERENCE VIDEO INPUT IS FOR GENLOCKING THE DPM-700 TO HOUSE REFERENCE (COLOR BLACK OR COMPOSITE VIDEO).

Figure 2-8. Frame Backplane (Left Half)


J4
TTY/INPUT SELECTOR
J5
PERIPHERAL
J6
ACCESSORY
J7
SLAVE/MODEL 100/110
J8
AC POWER
TP0341-219 Right
I
O
USE ONLY WITH A 250V FUSE
EMPLOYER UNIQUEMENT AVEC
UN FUSIBLE DE 250V
220-240V
BACKGROUND
CHANNEL 1
CHANNEL 2
INPUT
J19A
J19B
INPUT A
J20A
J20B
INPUT B
J21A
J21B
INPUT A
J22A
J22B
INPUT B
J23A
J23B
NOT USED
NOT USED
NOT USED
NOT USED
NOT USED
INPUTS
KEY OUTPUT
J15

THE TTY CONNECTOR IS A 25-PIN D-TYPE FEMALE. THIS PORT IS THE STATUS/DIAGNOSTIC TERMINAL. IT ALSO PROVIDES PARALLEL REAL-TIME CONTROL OF A DPM-733, DPM-734, AND/OR A GVG TEN-X®L 10x1 INPUT SELECTOR.

THE PERIPHERAL CONNECTOR IS A 9-PIN D-TYPE FEMALE. IT PROVIDES INTERFACE TO A GVG MODEL 200 OR 300 SWITCHER USING GVG PERIPHERAL PROTOCOL.

THE ACCESSORY CONNECTOR IS A 9-PIN D-TYPE FEMALE. ITS FACTORY DEFAULT SETUP LINKS COMMUNICATIONS FROM AN EDITOR, THROUGH THE SLAVE/MODEL100/110 PORT TO A SWITCHER.

THE SLAVE/MODEL 100/110 CONNECTOR IS A 9-PIN D-TYPE FEMALE. ITS FACTORY DEFAULT SETUP ALLOWS COMMUNICATION FROM DPM-700 TO SWITCHER AND FROM EDITOR TO SWITCHER THROUGH THE ACCESSORY PORT.

THE KEY OUTPUT IS THE ANALOG OUTPUT FOR THE SELECTED INTERNALLY-GENERATED KEY SIGNAL.

THE BACKGROUND INPUT ALLOWS YOU TO APPLY AN EXTERNAL VIDEO SOURCE TO THE KEYER AS A BACKGROUND FOR INSERTING PROCESSED (MANIPULATED) IMAGES.

THESE ARE ANALOG INPUTS FOR CHANNEL 1. THEY ARE ACTIVE ONLY IF AN ANALOG INPUT ACQUISITION SUBMODULE HAS BEEN INSTALLED ON THE ANALOG INTERFACE MODULE FOR CHANNEL 1.

THESE ARE ANALOG INPUTS FOR CHANNEL 2. THEY ARE ACTIVE ONLY IF AN ANALOG ACQUISITION BOARD HAS BEEN INSTALLED ON THE ANALOG INTERFACE MODULE FOR CHANNEL 2.

Figure 2-8. Frame Backplane (Right Half)

Connecting the Frame to Panel Cable

Make sure the frame's power supply switch is OFF before proceeding. Damage to sensitive circuitry can occur otherwise.

As shown in Figure 2-9, the frame and control panel are interconnected by a single, 15-conductor cable, which carries both serial control data and power. The cable provides +24 Vdc and -12 Vdc power to the control panel from the frame's power supply.

The total cable length must not exceed 100 meters. It can be ordered in standard lengths of 10, 30, or 100 meters, or there is an optional kit for custom-building the cable to any length under 100 meters. If you choose to build your own cable, refer to the cable wiring diagram in the Drawings section.

1. Unwrap and unravel the cable if necessary, and inspect it for bent connector pins or other damage. Then route the cable from the frame to the panel. The male connector of the cable goes to the frame and the female connector to the panel.

WARNING

Protect the cable from damage which can cause fire and/or equipment damage.

2. Connect the male connector of the cable to the backplane of the frame by inserting it fully into connector J2, labeled Control Panel. Screw in the retaining screws. Then connect the female connector to control panel connector J3.

CAUTION

Attach the cable securely so that it does not accidentally fall off or otherwise come loose during operation. Otherwise, damage to circuits or connectors may result from current surges or electrical arcing.

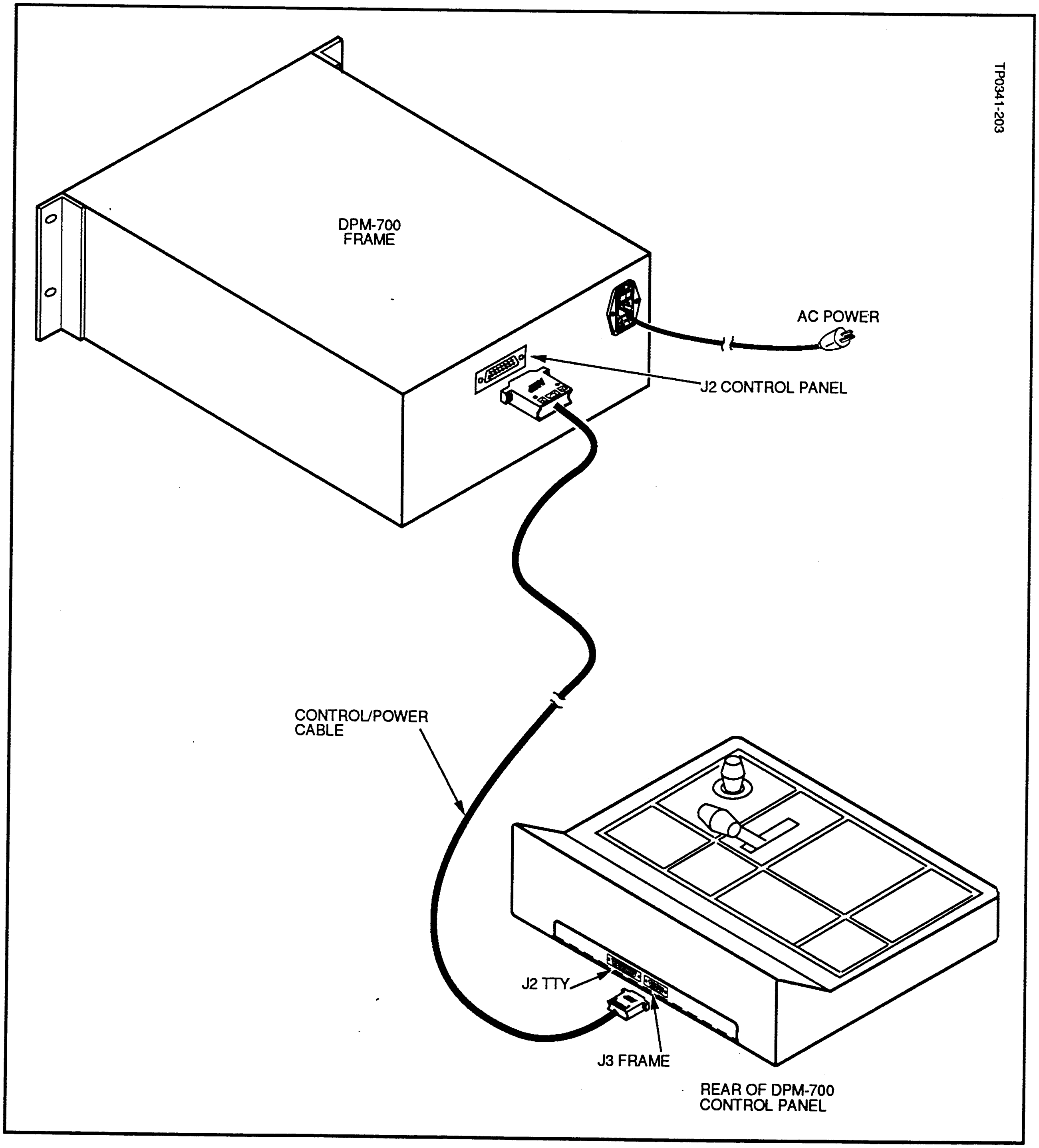

TP0341-203
DPM-700
FRAME
AC POWER
J2 CONTROL PANEL
CONTROL/POWER
CABLE
J2 TTY
J3 FRAME
REAR OF DPM-700
CONTROL PANEL

Figure 2-9. Interconnecting the Frame and the Control Panel

Connecting the Timing Reference Input

The DPM-700 has its own internal Sync/Subcarrier Timing Pulse Generators which enables it to "genlock" to the Timing Reference input you provide. Connect a stable source of composite color video to Timing Reference input connector J18A or J18B. These are looping connectors, so if one is left unused, it must be terminated in 75 ohms.

Any stable source of color composite video can be used, such as the video output of a sync generator, a video switcher, or a camera. Do not use a video tape recorder as your Timing Reference input unless it has a time base corrector (TBC). This is because the video output of a non-TBC tape machine varies in time as the speed of the tape changes.

The Timing Reference input is used as a starting reference for timing the DPM-700. In order for your DPM-700 to work perfectly with other devices in your studio system, the video signals passing among the devices must be timed or synchronized. Otherwise, when the signals are mixed together in the DPM-700, the video output will roll, jump, tear, or have incorrect colors. To prevent this problem, you will need to adjust both the horizontal and the subcarrier timing of all source devices, including your DPM-700. The DPM-700's internal timing can be adjusted using the STREAMLINE™ softpanel on the control panel. Refer to the setup and timing information later in this section for instructions.

Connecting the Video Channel Inputs

The standard system comes with two active primary video inputs— Channel 1A' and Channel 1B—which can be selected from the control panel to be used for transform effects. Additional modules are needed to make Channel 2 active, the installation of which is covered under Option Installation. For both Channel 1 and Channel 2, the inputs can be either analog or digital, depending on whether an analog or digital Input Submodule has been installed.

If you have an analog Input Submodule, connect the analog video inputs that you intend use for transformations to BNC connectors J20 through J23 at the right of the frame backplane of the frame. These are looping, unterminated inputs and will require termination in 75 ohms if any are left unused.

If you have a digital Input Submodule, connect the two digital video inputs you plan to use to 25-pin D connectors J11 through J14 on the left half of the backplane. These are non-looping inputs which do not need external terminations.

Timing: Timing of the video inputs is done using the DPM-700's standard STREAMLINE™ softpanel. The DPM-700 is very lenient in its timing requirements and can dynamically switch among its different timing modes without any recabling. However, for ease of timing, whenever possible, use the same length of cable for all sources. Timing is covered after cabling.

Optional Use of Analog Input Selectors: The number of sources you can ultimately route through a single analog video input connector can be considerably increased by the use of GVG analog input selectors, such as the TEN-X®L (DPM-733 or DPM-734) series. You can order an input selector from this series which is specially designed to work with the DPM-700. This option is covered later in this section under Option Installation.

Connecting the Background Video Input

Connect a source of composite video to the connectors labeled BACKGROUND, J19A" and J19B on the backplane. These function together as a looping input which must be terminated in 75 ohms if either connector is left unused. The BACKGROUND input serves as a source of background video for the keyer, over which the keyer can place a transformed video image. Any source desired may be used, such as live video, rolling videotape, stills, etc.

Timing: The propagation delay from the BACKGROUND input to the PROGRAM OUTPUT is 52 nanoseconds, ±5nS.

Connecting the Video and Key Signal Outputs

The DPM-700 provides analog PROGRAM outputs and both analog and digital CLEAN FEED and KEY outputs. Regardless of whether the DPM-700 has an analog or digital input submodule, all outputs, both analog and digital, are active as a standard feature. The analog outputs provide standard composite video for driving analog video monitors or other analog video devices. The digital outputs provide standard D2 video for driving digital tape machines or other digital video devices.

Program Outputs: Use connectors J17A and/or J17B for connecting the DPM-700 PROGRAM OUTPUT to a video monitor or other destination, such as a tape machine or video switcher. The connectors are separately-driven and do not need external terminations if left unconnected. The PROGRAM OUTPUT consists of the complete DPM-700 keyer output including background video and the transformed image keyed over the background with selectable cursor and fade-to-black.

Clean Feed Outputs: Use analog connectors J16A and 16B and digital connector J10 for connecting to the Fill video input of the keyer on a video switcher or other keying device. The connectors are all separately-driven and do not need external terminations if left unconnected. These outputs are very similar to the PROGRAM OUTPUT, except that their video signals are taken before the keyer. Thus, they carry only the DPM-700 final transformed video without any keying over the background video.

The CLEAN FEED outputs go hand-in-hand with the analog KEY OUTPUT, detailed below. The key signal "cuts the hole" for the CLEAN FEED video fill signal when the two signals are incorporated into a production switcher or other such device. Thus, using its "matched" key signal, the DPM-700's CLEAN FEED OUTPUT (transformed video) can be keyed-in over any number of other backgrounds provided by the switcher.

Key output: Use analog BNC connector J5 and digital connector J9 for connecting the KEY OUTPUT to the Key Source (hole-cut) input of a video switcher's keyer. The KEY OUTPUT carries the key signal just described in conjunction with the CLEAN FEED OUTPUT. The key signal is derived from a luminance key on the Channel 1 input video signal. As the user manipulates that input video, the DPM-700's key signal generator creates a manipulated key signal which exactly "mirrors" or matches its associated manipulated video signal.

Connecting to the Interface Ports (J1—J7)

As mentioned earlier, these are covered after Standard Installation and Option Installation because of their special nature. All of these ports are standardly active for all DPM-700 systems.

This completes the cabling procedures, except for connecting the ac line cord, which is described in the next subsection. You will need to leave the front cover off of the frame for the next set of procedures.

Initial Power-up

Selecting the AC Line Voltage And AC Fuse

Before applying ac power to the system, check for the correct voltage selection and fuse at the ac input connector, J8. Refer to Figure 2-10 and proceed as follows:

> CAUTION
>
> **Incorrect ac line voltage selection and/or incorrect ac fuse rating will damage the equipment.**

1. Locate the ac line receptacle assembly on the backplane. It should have a yellow cautionary banner across it which you can remove after reading. Insert a small flat-blade screwdriver into the slot at the top of the fuse drawer and pry the door open. Remove the drawer from the assembly.

2. As you hold the fuse drawer with the front facing you, the correct voltage range for your application should be in the lower right corner. The correct value fuse will be inserted into the holder on the left side of the drawer.

   If your house power is in the range of 90-132 Vac, use the 110-120V setting.

   If your house power is in the range of 180-264 volts, use the 220-240V setting.

   For either the 110 or 220 setting, the ac frequency must be 47-63 Hz.

3. Select the proper value of fuse for your application:
   - 2 amp 250V for 220-240V
   - 4 amp 250V for 110-120V

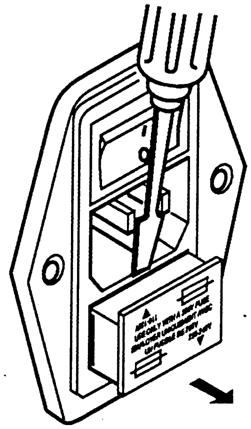
   Make sure the fuse is intact and in good condition.

4. Slide the fuse lock out of the left side of the fuse drawer, insert the fuse into the fuse holder, and slide the fuse lock back in place.

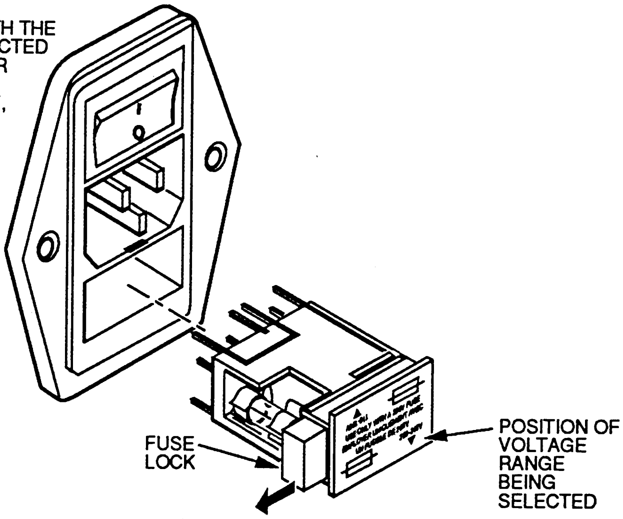
CAUTION
INCORRECT LINE VOLTAGE SELECTION CAN CAUSE DAMAGE TO THE EQUIPMENT

TO CHANGE THE LINE VOLTAGE SELECTION, PROCEED AS FOLLOWS:

1. USE A SMALL FLAT-BLADE SCREWDRIVER TO PRY OPEN THE FUSE DRAWER OF THE AC POWER CONNECTOR.
2. SLIDE THE FUSE DRAWER OUT OF THE AC POWER CONNECTOR.



3. HOLD THE FUSE DRAWER WITH THE VOLTAGE RANGE TO BE SELECTED IN THE LOWER RIGHT CORNER (POINTING DOWN). SLIDE THE FUSE-LOCK AT THE LEFT SIDE, OUT OF THE FUSE DRAWER.


FUSE LOCK
POSITION OF VOLTAGE RANGE BEING SELECTED

4. INSERT THE CORRECT VALUE FUSE INTO THE FUSE HOLDER AT THE LEFT, FUSE-LOCK END FIRST AND CLOSE THE FUSE LOCK.
5. WITH THE PROPER VOLTAGE RANGE IN THE LOWER-RIGHT CORNER, INSERT THE FUSE DRAWER INTO THE AC POWER CONNECTOR. THE FUSE SHOULD BE ON THE LEFT AND THE ARROW FOR THE VOLTAGE RANGE BEING SELECTED SHOULD POINT DOWN.
6. CONNECT THE POWER CORD.

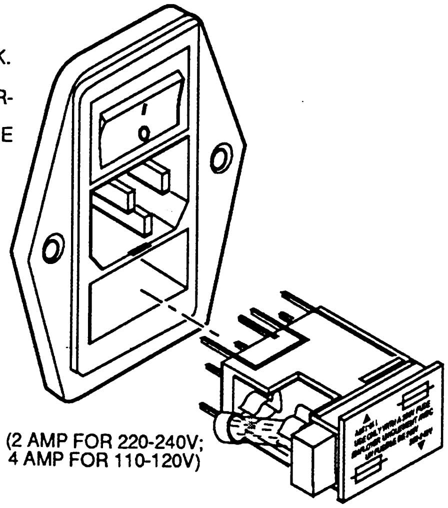

(2 AMP FOR 220-240V;
4 AMP FOR 110-120V)

Figure 2-10. AC Line Voltage and Fuse Selection

5. With the correct voltage range in the lower right corner, insert the fuse drawer into the receptacle assembly. The front should be flush with the assembly.

6. Plan a safe routing path for the ac line cord and connect the line cord to the DPM-700's ac input connector. Then connect the other end of the cord to a suitable house power source receptacle. The DPM-700 draws a maximum of 3 amps at 120 Vac and a maximum of 1.5 amps at 220 Vac.

WARNING

The ac line cord carries lethal electricity. Protect the cord from damage, which can cause electrocution, fire, and/or equipment damage. Also, to guard against shock hazards which can result in injury or death, ensure that the center conductor of the power cord is connected to a proper earth ground.

This completes the ac voltage selection, ac fuse selection, and connection and routing of the ac line cord.

Initial Power-up Test

The purpose of this test is to ensure that your DPM-700 is functioning in its most basic start-up condition before proceeding with installation.

1. Be sure that the disk drive located in the left side of the control panel has no disk in it. If it does, when initial ac power is applied, the DPM-700 can boot-up in the wrong starting condition and subsequent procedures can be invalid.

2. (The front cover of the frame should still be off.) Turn on the switch on the power cord connector at the back of the electronics frame (press "1"). On the front of the frame, turn on the main power switch (press the "1"). This will apply ac power to the system, and the unit will begin booting-up.

3. Listen to make sure the cooling fans have started. (Recall that there are two fans in the power supply compartment.) If the fans are not blowing, turn the main power switch off (press "Ø") and refer to step 6.

4. Within a few seconds, the microprocessor circuits will complete their power-up self-tests, and place the control panel in its start-up state, ready for control input from the operator.

5. The control panel's start-up state is shown in Figure 2-11. Compare the drawing with your control panel to make sure that they match. Important elements to watch for are: what the main (Streamline™) menu says, what the three red LED displays say, and which keys and status lights are illuminated. On the drawing, illuminated keys are shaded gray. Exceptions to the state shown are noted under the figure.

   When the control panel first comes up in this start-up state after power-up, you should be seeing your Channel 1 input A source video full-screen (not manipulated) on your Program Output video monitor, assuming the default keyframe is the factory default. This is true of course, only if you have correctly cabled your inputs and outputs, and if your source device is sending video to your Channel 1A input.

6. If the DPM-700 fails any of the above tests, please contact the distributor who sold you the equipment for warranty service. Do not repair the unit yourself because you may invalidate your warranty.

   If the DPM-700 appears ready to operate, replace the frame front cover (unless you plan to install options) and continue with installation.

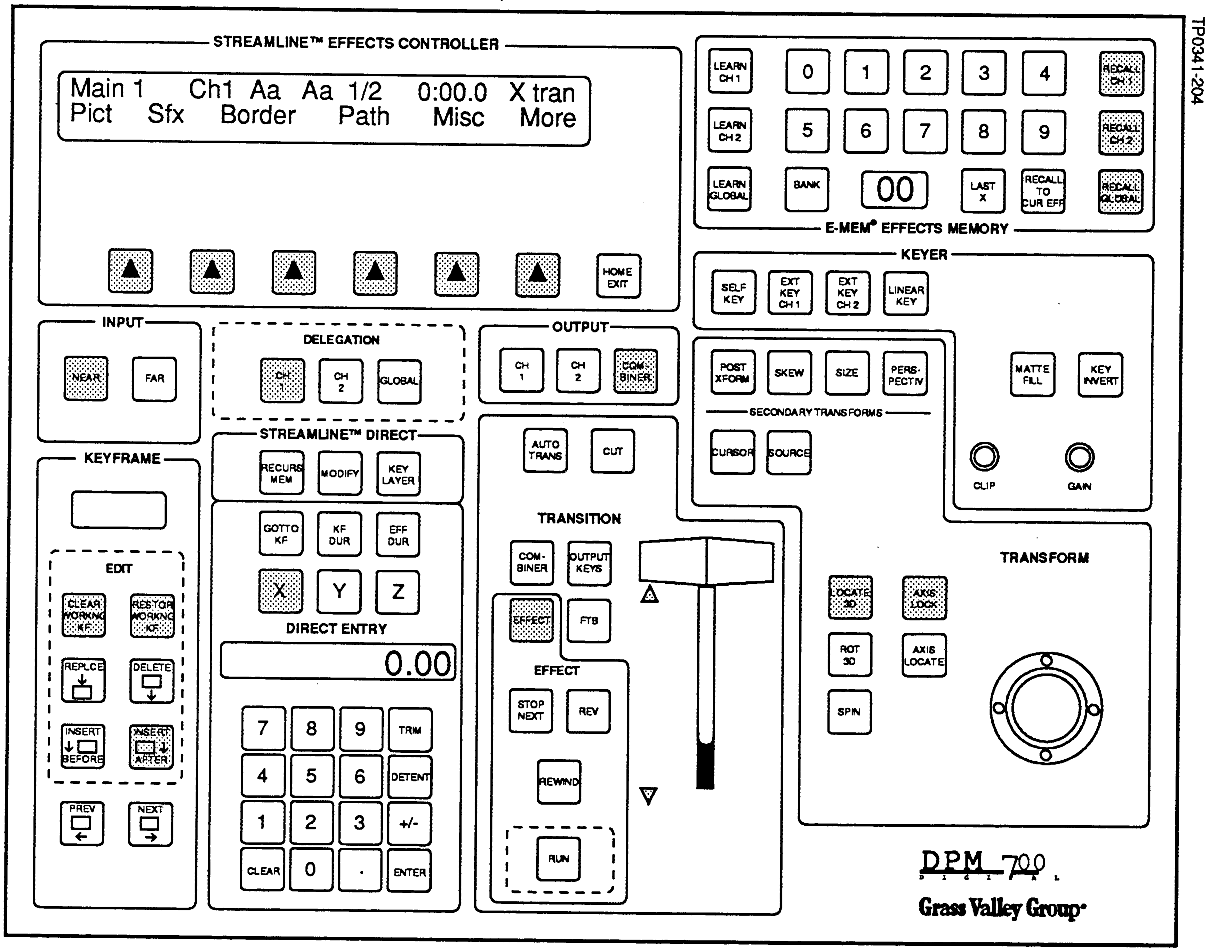

STREAMLINE™ EFFECTS CONTROLLER
Main 1 Ch1 Aa Aa 1/2 0:00.0 X tran
Pict Sfx Border Path Misc More
HOME EXIT
LEARN CH 1
0
1
2
3
4
RECALL CH 1
LEARN CH 2
5
6
7
8
9
RECALL CH 2
LEARN GLOBAL
BANK
00
LAST X
RECALL TO CUR EFF
RECALL GLOBAL
E-MEM® EFFECTS MEMORY
KEYER
SELF KEY
EXT KEY CH 1
EXT KEY CH 2
LINEAR KEY
INPUT
NEAR
FAR
DELEGATION
CH 1
CH 2
GLOBAL
OUTPUT
CH 1
CH 2
COM-BINER
POST XFORM
SKEW
SIZE
PERS-PECTIV
SECONDARY TRANSFORMS
CURSOR
SOURCE
MATTE FILL
KEY INVERT
CLIP
GAIN
STREAMLINE™ DIRECT
RECURS MEM
MODIFY
KEY LAYER
KEYFRAME
EDIT
CLEAR WORKNG KF
RESTOR WORKNG KF
REPLCE
DELETE
INSERT BEFORE
INSERT AFTER
PREV
NEXT
GOTTO KF
KF DUR
EFF DUR
X
Y
Z
DIRECT ENTRY
0.00
7
8
9
TRIM
4
5
6
DETENT
1
2
3
+/-
CLEAR
0
.
ENTER
AUTO TRANS
CUT
TRANSITION
COM-BINER
OUTPUT KEYS
EFFECT
FTB
EFFECT
STOP NEXT
REV
REWIND
RUN
TRANSFORM
LOCATE 3D
AXIS LOCK
ROT 3D
AXIS LOCATE
SPIN
DPM 700 DIGITAL
Grass Valley Group
TP0341-204

Figure 2-11. Control Panel Start-up State. (Grey-shading indicates key is lit.) The COMBINER key in the OUTPUT section is lit when two channels are installed. When one channel is installed the key is lit that corresponds to the frame slot used. Other keys may be lit that are not shown so here, if certain selections were made that are stored in Source Memory before the last shut-down.

KEYLAYER™ OPERATION

The DPM-700 has a special feature called KeyLayer™ that allows you to physically cable your DPM-700 for both upstream and downstream operation with a switcher. You can then change between the two modes, through software, with no recabling necessary. This gives you the flexibility to layer graphics on top of each other in whatever order is required in order to produce a desired effect. Figure 2-12 shows simultaneous upstream and downstream cabling of the DPM-700 with a switcher.

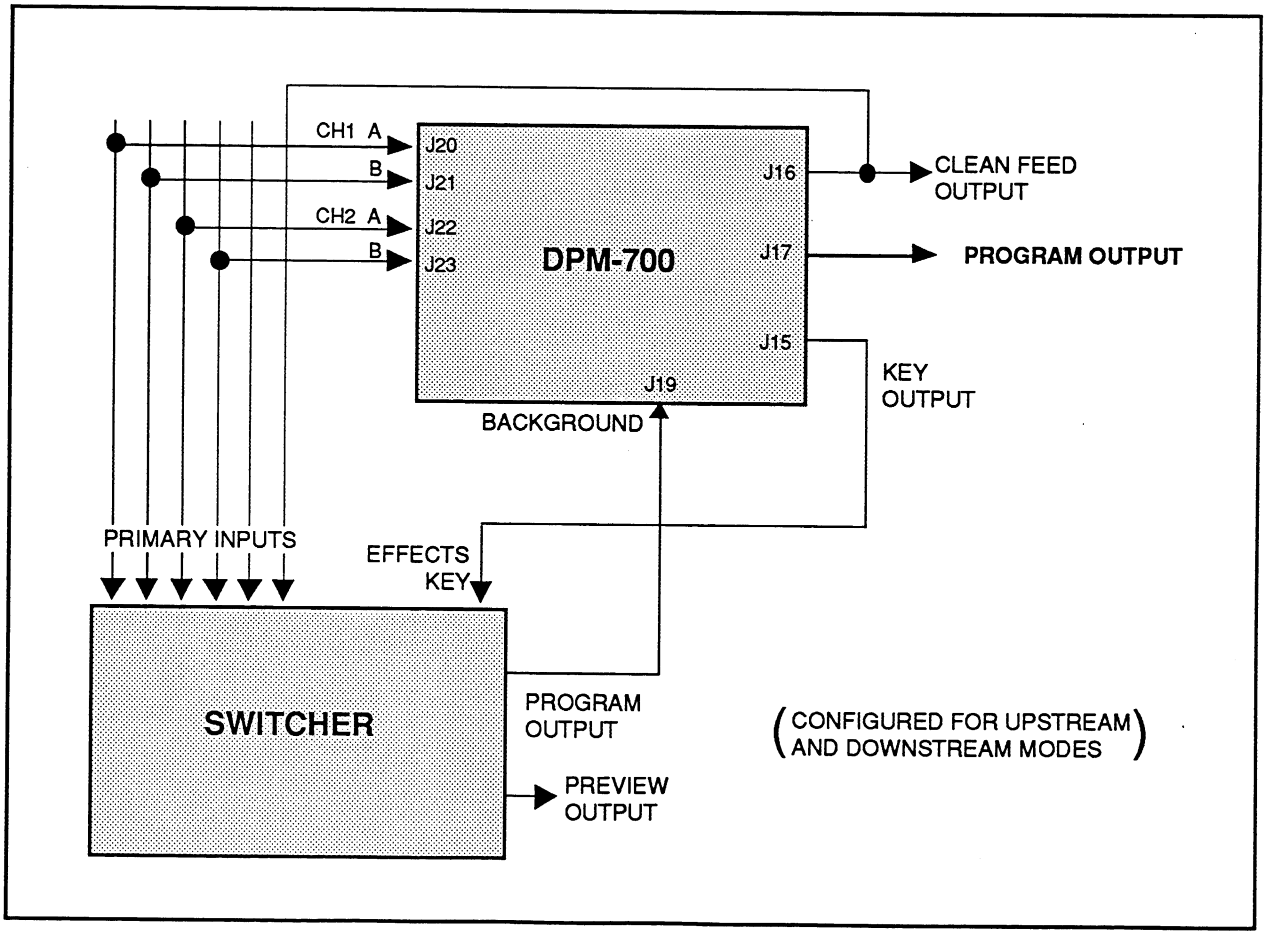

CH1 A
B
CH2 A
B
J20
J21
J22
J23
DPM-700
J16
J17
J15
J19
BACKGROUND
CLEAN FEED OUTPUT
PROGRAM OUTPUT
KEY OUTPUT
PRIMARY INPUTS
EFFECTS KEY
SWITCHER
PROGRAM OUTPUT
PREVIEW OUTPUT
(CONFIGURED FOR UPSTREAM AND DOWNSTREAM MODES)

Figure 2-12. Cabling For KeyLayer™ Operation

KeyLayer™ Modes

Upstream Mode: In upstream mode, the DPM-700's CLEAN FEED OUTPUT feeds one of the primary inputs of the switcher, and the DPM-700's KEY OUTPUT feeds the switcher's effects key input. This allows the switcher's keyer to layer DPM-700 images over other signals. The switcher's downstream keyer can place a title over the entire effect. The final program output of the switcher feeds the BACKGROUND input of the DPM-700, which passes directly to the DPM-700's PROGRAM OUTPUT with no further keying.

Downstream Mode: In downstream mode, the switcher's program output again feeds the BACKGROUND input of the DPM-700, but the DPM-700's keyer inserts transformed video into this background. The completed effect then passes to the DPM-700's PROGRAM OUTPUT. Downstream mode leaves the switcher's effects keyer free for doing other keys in the background over which the DPM-700 transformed video will be placed. Titles done in the switcher's downstream keyer will appear under the DPM-700's transformed video layer.

FIXED UPSTREAM CONFIGURATION

You can connect your DPM-700 in a strictly upstream or downstream configuration, if one or the other is better suited to your purposes.

Figure 2-13 shows how you connect the system in a fixed upstream configuration. In this setup the switcher program output goes directly to the next process in your system instead of going through the DPM-700. One of the DPM-700 CLEAN FEED OUTPUTS, with manipulated video, is used as one of the switcher's primary inputs. The DPM-700 KEY OUTPUT, with manipulated key signal, can be used for the switcher's effects key or downstream key. The PROGRAM OUTPUT of the DPM-700 can be used for an effects monitor with cursor insertion by connecting the other CLEAN FEED OUTPUT to the BACKGROUND input. The switcher's downstream keys will be layered over the DPM-700 effects.

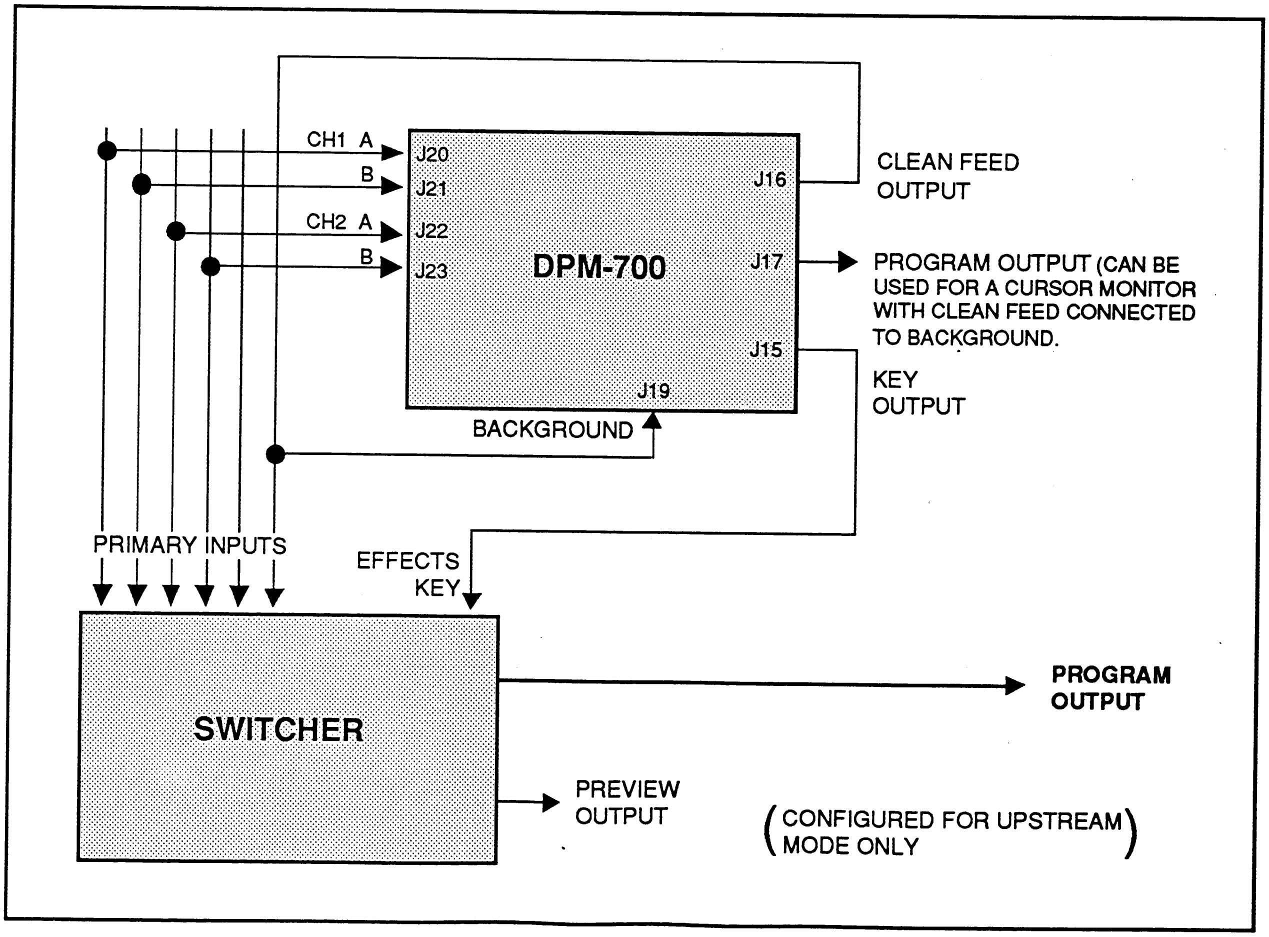

CH1 A
B
CH2 A
B
J20
J21
J22
J23
DPM-700
J16
J17
J15
J19
BACKGROUND
CLEAN FEED OUTPUT
PROGRAM OUTPUT (CAN BE USED FOR A CURSOR MONITOR WITH CLEAN FEED CONNECTED TO BACKGROUND.
KEY OUTPUT
PRIMARY INPUTS
EFFECTS KEY
SWITCHER
PROGRAM OUTPUT
PREVIEW OUTPUT
(CONFIGURED FOR UPSTREAM MODE ONLY)

Figure 2-13. Cabling For Fixed Upstream Operation

FIXED DOWNSTREAM CONFIGURATION

For operation in a fixed downstream configuration, connect your DPM-700 as shown in Figure 2-14. In this configuration, the DPM-700 manipulated video is keyed over the output of the switcher. The switcher's program output is connected to the DPM-700's BACKGROUND input. The DPM-700's PROGRAM OUTPUT is used in the next stage of your studio process.

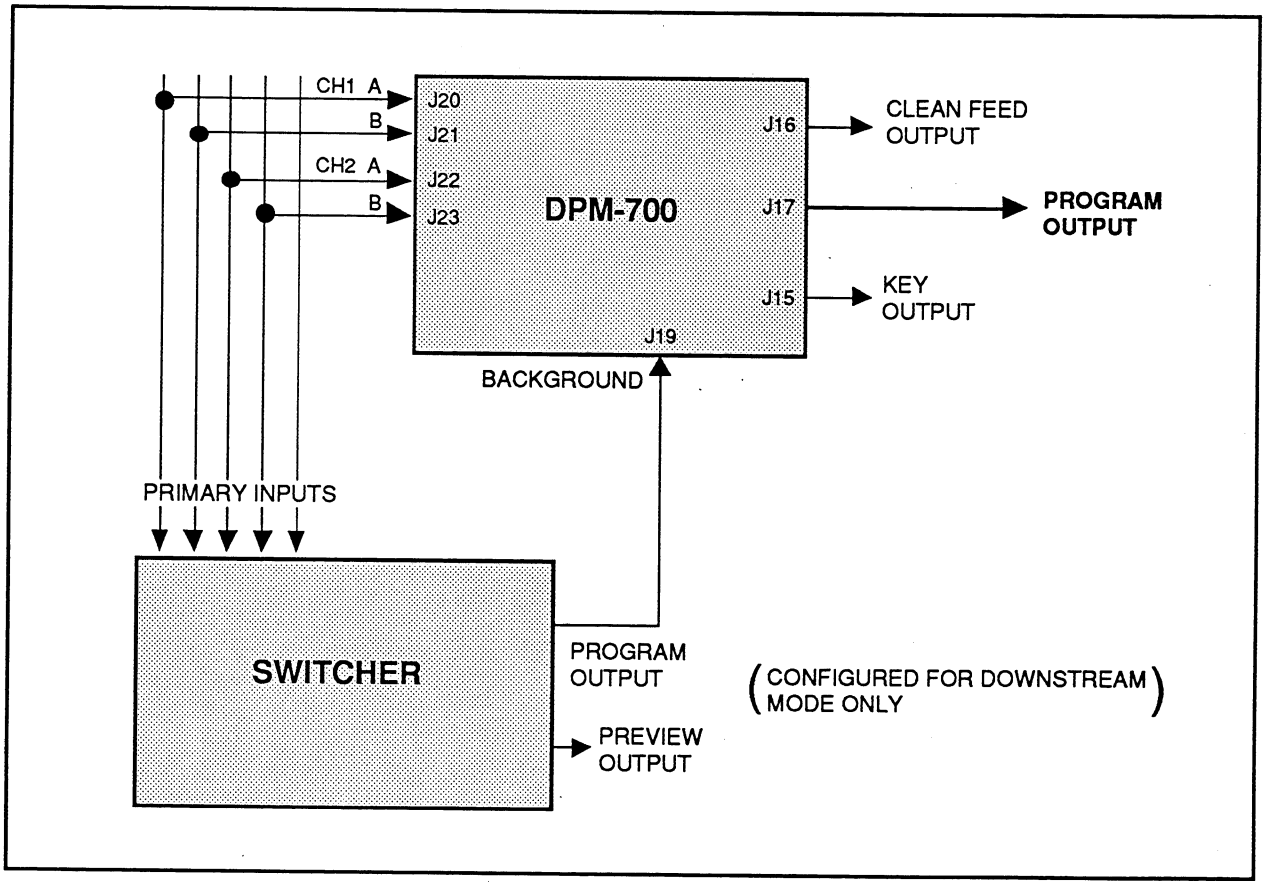

CH1 A
B
CH2 A
B
J20
J21
J22
J23
DPM-700
J16
J17
J15
J19
CLEAN FEED OUTPUT
PROGRAM OUTPUT
KEY OUTPUT
BACKGROUND
PRIMARY INPUTS
SWITCHER
PROGRAM OUTPUT
PREVIEW OUTPUT
(CONFIGURED FOR DOWNSTREAM MODE ONLY)

Figure 2-14. Cabling For Fixed Downstream Operation

TIMING ADJUSTMENTS

For the DPM-700 in KeyLayer™ mode to stay in time with the system, CLEAN FEED video must be in time with the switcher inputs for upstream operation and in time with the switcher's program output for downstream operation. The timing must be adjusted for each case.

If your system is configured for fixed upstream operation, it is recommended that you set both upstream and downstream timing. This ensures that CLEAN FEED will be timed to the switcher inputs, even if "canned" effects are used that switch between the two modes. To do so, follow the PREPARATION and UPSTREAM TIMING instructions in Table 2-1, then copy the upstream timing to downstream by following the procedure under "Copying Upstream Timing To Downstream" after Table 2-1.

Fixed downstream configurations can be timed in the same way by following the PREPARATION and DOWNSTREAM TIMING instructions in Table 2-1. To copy the timing to upstream mode, follow the outlined procedure located after Table 2-1 called "Copying Downstream Timing to Upstream"

Output and Input Timing

There are adjustments for both output timing and input timing. Output timing is adjusted while GLOBAL is selected. This matches the DPM-700 CLEAN FEED OUTPUT to the switcher inputs in upstream mode and to the BACKGROUND INPUT in downstream mode. Input timing is performed while CH1 or CH2 is selected in the DELEGATION section. This matches the inputs to the CLEAN FEED OUTPUT for both upstream and downstream.

Upstream and Downstream Timing

Upstream and downstream timing adjustments require different methods. Upstream requires that the DPM-700 and switcher video be combined in the switcher so they can be matched. This is done with a mix for the output adjustment and with a wipe for the input adjustment. Downstream timing adjustment requires the matching to be done at the DPM-700 keyer. DPM-700 transformed video is keyed over the switcher's program output for both the output and the input adjustments.

TIMING PROCEDURE

Follow the instructions in Table 2-1 to time the DPM-700 for upstream and/or downstream operation. After the system is timed, the settings are kept in battery-backup RAM. It's a good idea to save the settings on floppy disk as a safety backup. To do so, refer to "Saving Your Setup To Disk" later in this section.

The procedure in Table 2-1 presents tasks, actions, and results in separate columns. Actions such as button-pushes, adjustments, and observations make up the tasks. The results column contains explanations and illustrations of what to expect when the described actions are taken.

The instructions in this procedure are given in a specific order from a known starting point. It is important that only the controls specified are manipulated during the procedure.

***Note:** In the following instructions the pushbuttons labeled with fixed functions are indicated by straight brackets* [ ], *and the STREAMLINE™ display "softkey" selections are indicated by curved brackets* { }.

All of the DPM-700 control panel pushbuttons that will be used in this procedure are in the STREAMLINE™ EFFECTS CONTROLLER, DELEGATION, DIRECT ENTRY, and KEYFRAME sections. Do not use the [CH1] or [CH2] pushbuttons in the OUTPUT section.

Knowledge Required

This procedure assumes the user has a working knowledge of the functions and uses of vectorscopes, waveform monitors, and video monitors, and is capable of operating all other video equipment used in the system being timed.

***NOTE:** If you are not familiar with video timing, Grass Valley Group offers two publications which will help: NTSC Studio Timing: Principals and Applications and Professional Video Tutorial. For PAL, see PAL Studio Timing: Principals and Applications.They are available from your local sales office.*

Test Equipment

Test equipment needed:

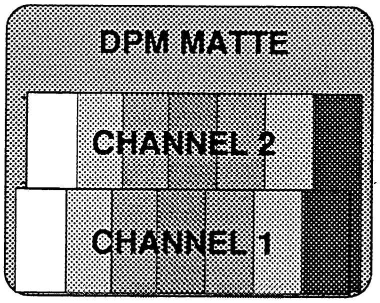
- Waveform monitor and vectorscope (Tektronix 1480 [NTSC] or 1481 [PAL], or equivalent)
- High quality color video monitor

Timing Different Configurations

How you use this procedure depends on how your DPM-700 is cabled. Use the PREPARATION section of the procedure for all configurations. Use the other sections as follows:

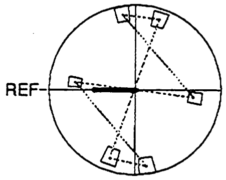
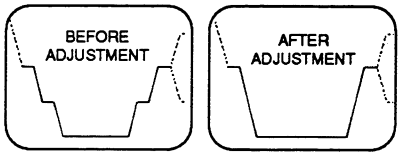
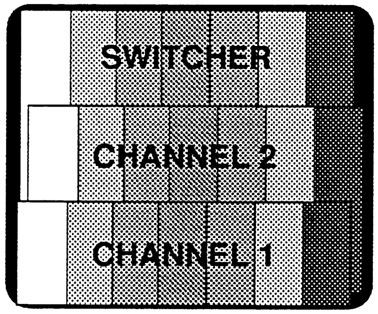
- KeyLayer™ Configuration (Figure 2-12)
  Use the entire procedure in Table 2-1.
- Fixed Upstream Configuration (Figure 2-13)
  Use the PREPARATION and UPSTREAM TIMING sections of Table 2-1 only. Do not use the DOWNSTREAM section to time a fixed upstream configuration. See "Copying Upstream Timing To Downstream" after Table 2-1.
- Fixed Downstream Configuration (Figure 2-14)
  Use the PREPARATION and DOWNSTREAM TIMING sections of Table 2-1 only. Do not use the UPSTREAM section to time a fixed downstream configuration. See "Copying Downstream Timing to Upstream" after Table 2-1.

Table 2-1. Timing Procedure

Task	Action	Result
PREPARATION	Turn off the blanking processor on the switcher, if so equipped. Use the same external reference-black for all equipment.	Syncronizes all equipment to the same reference.
Test Equipment Setup	For the fixed upstream configuration: Monitor the program output of the switcher with the waveform monitor, vectorscope, and video monitor. For KeyLayer™ or fixed downstream configurations: Monitor the DPM-700 PROGRAM OUTPUT, J17, with the waveform monitor, vectorscope, and video monitor. Apply power to all equipment.	
Setting The Factory Default	Press DPM-700 pushbuttons: **[CH1]+[CH2]+[GLOBAL]** (all 3 together under DELEGATION) **[HOME/EXIT]** (1 second) > **{More}** **{Person}** > **{Def}** > **{ClrKF}** **{DefKF}** > **{Yes}** > **{ClrSrc}** > **{Yes}** **[CLEAR WORKNG KF]** (1 sec.)	Sets all keyframe parameters to the factory default.
Selecting Source Signals	Use color bars for inputs, as follows: • DPM-700 Channel 1 • DPM-700 Channel 2 • Switcher Primary Input	Selects the same external color bar source for both DPM-700 channels and the switcher program output.
Placing DPM-700 Video On The Monitor	Press DPM-700 pushbuttons: **[KEY LAYER]** **{Bkgnd}** > **{MATTE}** One channel systems: **[CH1]** (DELEGATION section) **[Y]** > **[+/-]** > **[2]** > **[ENTER]** Two channel systems: **[CH1]** (DELEGATION section) **[Y]** > **[+/-]** > **[4]** > **[ENTER]** **[CH 2]** (DELEGATION section) **[Y]** > **[+/-]** > **[2]** > **[ENTER]**	Positions the Channel 1 and Channel 2 video (two channel systems) on the video monitor. 

Note: *Do Not change any Transform values with either the joystick or the DIRECT ENTRY keypad. The default horizontal position must remain set.*

Table 2-1. Timing Procedure (continued)

Task	Action	Result
UPSTREAM TIMING	**[HOME EXIT]** (for one second) **{More} > {Eng} > {Setup} > {Video}** **{Timing} > {Yes} > {Adjust} > {Up}**	Sets up the display menu for Upstream Timing.
Output Subcarrier Adjustment	Take color bars directly on the switcher.	Monitors switcher output only.
	Set the color bar burst vector to a reference on the vectorscope.	
	Press DPM-700 pushbuttons: **[GLOBAL] > {SC}**	Selects output timing. Puts "SC" in the top-right corner of the DPM-700 display indicating the display knob will adjust subcarrier.
	Cut to the DPM-700 CLEAN FEED directly on the switcher.	Monitors DPM-700 output only.
	Adjust the display knob to match the DPM-700 matte burst vector to the reference on the vectorscope.	The switcher and the DPM-700 burst vectors will be set at the same reference.
Output Sync Adjustment	Set the switcher for mix mode. Perform a 50% mix of color bars and DPM-700 CLEAN FEED.	Provides a monitored output of switcher and DPM-700 color bars with a 50% mix of sync intervals.
	Press DPM-700 pushbutton: **{SYNC}**	The display knob is set for Sync adjustment.
	Set expanded H-rate on the wave-form monitor.	
	Adjust the display knob to achieve a straight leading edge on the sync pulse, as shown at right.	
Input Timing Setup	Set the switcher for wipe mode. Perform a 1/3 vertical wipe on the switcher from color bars to the DPM-700 (hard edge, no border).	
	The video monitor should appear similar to the illustration at right.	
	With a one channel system, Channel 1 will be in the position shown for Channel 2.	

Note: *The color bar positions and colors may differ at this time.*

Table 2-1. Timing Procedure (continued)

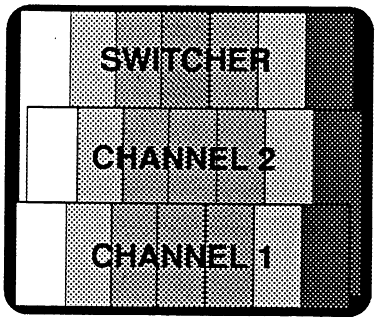
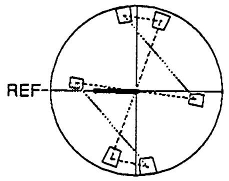
Task	Action	Result
Input Subcarrier Adjustment	Press DPM-700 pushbuttons:	
	For two channel systems: **[CH2]** (DELEGATION) > **{SC}**	Selects subcarrier adjustment for the Channel 2 input timing.
	Adjust the display knob to place the color bar vectors in the 2% boxes on the vectorscope.	Aligns the Channel 2 color bar vectors with the switcher's.
	For one and two channel systems: **[CH1]** (DELEGATION) > **{SC}**	Selects subcarrier adjustment for the Channel 1 input timing.
	Adjust the display knob to place the color bar vectors in the 2% boxes.	Aligns the Channel 1 color bar vectors with Channel 2 & the switcher.
Input Sync Adjustment	For two channel systems: **[CH2]** (DELEGATION) > **{Sync}**	Selects sync adjustment for the Channel 2 input timing.
	Adjust the display knob to horizontally align the Channel 2 color bars with the switcher color bars.	Aligns the horizontal sync of Channel 2 with the switcher.
	For one and two channel systems: **[CH1]** (DELEGATION) > **{Sync}**	Selects sync adjustment for the Channel 1 input timing.
	Adjust the display knob to horizontally align Channel 1 color bars with Channel 2 and switcher color bars.	Aligns the horizontal sync of Channel 1 with Channel 2 and the Switcher.
Note: *It may be necessary to repeat Subcarrier and Sync Adjustments because the adjustments are interactive.*		
DOWNSTREAM TIMING	Press DPM-700 pushbuttons: **[HOME EXIT]** (1 second) **{More}** > **{Eng}** > **{Setup}** > **{Video}** **{Timing}** > **{Yes}** > **{Adjust}** **{Down}** > **{SC}**	Enters timing menu and sets the display knob for subcarrier adjust.
	[GLOBAL] (DELEGATION)	Selects output timing.
	[KEY LAYER] > **{Bkgnd}** > **{EXT}**	Puts EXTERNAL BACKGROUND on DPM-700 PROGRAM OUTPUT.
	Take color bars directly on the switcher.	
	The video monitor should appear similar to the illustration at right.	
	With a one channel system, Channel 1 will be in the position shown for Channel 2.	

Table 2-1. Timing Procedure (continued)

Task	Action	Result
Output Subcarrier Adjustment	Adjust the vectorscope to set the switcher burst vector to the reference.	
	At the DPM press: **{MATTE}** **[HOME EXIT]** (twice, quickly)	
	Adjust the DPM-700 display knob to set the matte burst vector to the reference on the vectorscope.	
Output Sync Adjustment	At the DPM press: **[KEY LAYER]** **{BKGND} > {EXT}**	Puts EXTERNAL BACKGROUND on DPM-700 PROGRAM OUTPUT.
	Adjust the waveform monitor to set the leading edge of the switcher sync pulse to a reference.	Aligns the EXT. BACKGROUND to a reference on the waveform monitor.
	At the DPM press: **{MATTE}** **[HOME EXIT]** (twice, quickly) **{Sync}**	Selects sync adjustment of the DPM output.
	Adjust the DPM display knob to set the leading edge of the matte sync pulse to the same reference on the waveform monitor.	Aligns the DPM-700 output timing to the switcher.
Input Subcarrier Adjustment	**[KEY LAYER] > {BKGND} > {EXT}** **[HOME EXIT]** (twice, quickly) **> {SC}**	Selects switcher program out for subcarrier adjustment.
	For two channel systems: **[CH2]** (DELEGATION)	Selects Channel 2 for subcarrier timing.
	Adjust the DPM display knob to place the color bar vectors in the 2% boxes on the vectorscope.	Aligns the color bar vectors with the background vectors.
	For one and two channel systems: **[CH1]** (DELEGATION)	Selects Channel 1 for subcarrier timing.
	Adjust the display knob to align the color bar vectors in the 2% boxes.	Aligns the color bar vectors with the background vectors.
Input Sync Adjustment	Press **{Sync}**	Selects switcher program out for sync adjustment with display knob.
	For two channel systems: **[CH2]** (DELEGATION)	Selects Channel 2 for input sync adjustment.
	Adjust the display knob to align the Channel 2 color bars with the switcher color bars on the video monitor.	Aligns the Channel 2 horizontal sync with the switcher.
	For one and two channel systems: **[CH1]** (DELEGATION)	Selects Channel 1 for input sync adjustment.
	Adjust the display knob to align the Channel 1 color bars with the Channel 2 and switcher color bars.	Aligns the Channel 1 horizontal sync with Channel 2 and the switcher.

Note: *It may be necessary to repeat Subcarrier and Sync Adjustments because the adjustments are interactive.*

Copying Upstream Timing To Downstream

If you are using a fixed upstream configuration you can set the downstream timing to the same values using the following basic procedure. This ensures that the timing is correct regardless of the mode selected. The downstream settings are copied to the upstream mode. This procedure assumes that upstream timing was already set using Table 2-1. The timing selections and basic procedure follow:

- Preparation:
  If you did not just complete the procedure in Table 2-1, return there now and follow the PREPARATION section instructions.
  Then press DPM-700 pushbuttons:
  [HOME EXIT] (for one second)
  {More} > **{Eng}** > **{Setup}** > **{Video}**
  {Timing} > **{Yes}** > **{Adjust}**
- Output Sync Timing:
  Select **[GLOBAL]** > **{Sync}** > **{Up}**
  Note the value in the DIRECT ENTRY display and select **{Down}**. Enter the noted value with the keypad and press **[ENTER]**.
- Output Subcarrier Timing:
  Select **{SC}** > **{Up}**
  Note the value in the DIRECT ENTRY display and select **{Down}**. Enter the noted value with the keypad and press **[ENTER]**.
- Input Sync Timing:
  Select **{Sync}** > **{Up}** and—
  - For two channels;
    Select **[CH2]** (DELEGATION)
    Note the value in the DIRECT ENTRY display and select **{Down}**. Enter the noted value with the keypad and press **[ENTER]**.
  - Select **[CH1]** (DELEGATION) > **{Up}**
    Note the value in the DIRECT ENTRY display and select **{Down}**. Enter the noted value with the keypad and press **[ENTER]**.
- Input Subcarrier Timing:
  Select **{SC}** > **{Up}** and—
  - For two channels;
    Select **[CH2]** (DELEGATION)
    Note the value in the DIRECT ENTRY display and select **{Down}**. Enter the noted value with the keypad and press **[ENTER]**.
  - Select **[CH1]** (DELEGATION) > **{Up}**
    Note the value in the DIRECT ENTRY display and select **{Down}**. Enter the noted value with the keypad and press **[ENTER]**.

Copying Downstream Timing To Upstream

If you are using a fixed downstream configuration you can set the upstream timing to the same values using the following basic procedure. This ensures that the timing is correct regardless of the mode selected. The downstream settings are copied to the upstream mode. This procedure assumes that downstream timing was already set using Table 2-1. The timing selections and basic procedure follow:

- Preparation:
  If you did not just complete the procedure in Table 2-1, return there now and perform the PREPARATION section.
  Then press DPM-700 pushbuttons:
  [HOME EXIT] (for one second)
  {More} > {Eng} > {Setup} > {Video}
  {Timing} > {Yes} > {Adjust}
- Output Sync Timing:
  Select **[GLOBAL] > {Sync} > {Down}**
  Note the value in the DIRECT ENTRY display and select **{Up}**. Enter the noted value with the keypad and press **[ENTER]**.
- Output Subcarrier Timing:
  Select **{SC} > {Down}**
  Note the value in the DIRECT ENTRY display and select **{Up}**. Enter the noted value with the keypad and press **[ENTER]**.
- Input Sync Timing:
  Select **{Sync} > {Down}** and—
  - For two channels;
    Select **[CH2]** (DELEGATION)
    Note the value in the DIRECT ENTRY display and select **{Up}**. Enter the noted value with the keypad and press **[ENTER]**.
  - Select **[CH1]** (DELEGATION) **> {Down}**
    Note the value in the DIRECT ENTRY display and select **{Up}**. Enter the noted value with the keypad and press **[ENTER]**.
- Input Subcarrier Timing:
  Select **{SC} > {Down}** and—
  - For two channels;
    Select **[CH2]** (DELEGATION)
    Note the value in the DIRECT ENTRY display and select **{Up}**. Enter the noted value with the keypad and press **[ENTER]**.
  - Select **[CH1]** (DELEGATION) **> {Down}**
    Note the value in the DIRECT ENTRY display and select **{Up}**. Enter the noted value with the keypad and press **[ENTER]**.

After The Timing Adjustments

All color bars should align vertically and match in color at this time. To time your remaining input(s) refer to "Timing The Other Inputs" using the "copy all" function, on the following pages. To create a backup copy of your settings on a floppy disk, refer to "Saving Your Setup To Disk", later in this section.

If you want your system to boot up in a default condition other than the factory default, you must set up those conditions and save them using the Engineering menu. For details, refer to your DPM-700 Operator's Handbook.

Timing The Other Inputs

If you use your "B" input(s) or have an optional 10x1 Input Selector you can do a "copy all" to copy the timing settings to all inputs. The other inputs must be in time with the input that was used for timing and with each other. Copy the settings for both modes; upstream and downstream.

- To perform a "copy all" for upstream, press **[CH1]+[CH2]+[GLOBAL]** all at once. Press **[HOME/EXIT]** for one second, then press **{More}** > **{Eng}** > **{Setup}** > **{Video} {Timing}** > **{Yes}** > **{Adjust}**, **{Up}**, and repeat **{NextIn}** until the timed input is displayed. Press **[HOME/EXIT]** and then **{Cpyall}** to copy the settings to the other inputs. Repeat the same keystrokes, substituting **{Down}** for **{Up}** to perform a "copy all" for downstream.

  This will copy your timing adjustments to all other inputs simultaneously; you may still need to make slight adjustments for cable length differences.

- If the inputs are not in time, or if you need to touch up individual inputs, use color bars at each input and select the same source on the switcher's program bus. Then perform Input Timing in the DOWNSTREAM TIMING procedure and/or the UPSTREAM TIMING procedure for each input. You can press **{NextIn}** in the timing menu to step through the inputs.

Key Timing

The last thing to do when timing the system is to verify that the key timing into the switcher is correct. The DPM-700 puts out a KEY OUTPUT signal that is in time with its CLEAN FEED OUTPUT. Some switchers, including the Model 100 and 110 Switchers, require that the key signal be in time with the respective fill video. Other switchers, such as older Model 100 Switchers, require that the key signal be delayed. See your switcher service manual if adjustment to key timing is necessary.

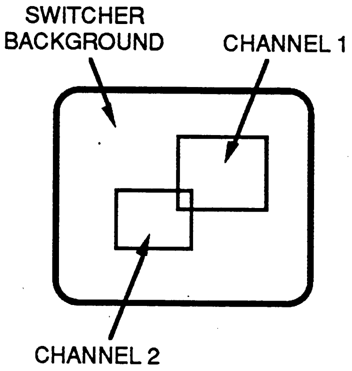
SYSTEM SETUP FUNCTIONS

Some of the operating attributes of the DPM-700 should be set during installation. Two of these are the system Setup Crop and NTSC Black Setup.

Setup Crop

Setup Crop "cuts off" one or more sides of the DPM-700's output picture. It is an overall system setup function which affects both channels identically and at all times. Setup Crop settings are stored as part of the DPM-700's personality setup.

Different video sources have different blanking widths. This can result in a black edge at the left or right sides of the picture when you reduce its size to less than full-screen. To permanently eliminate these blanked edges, adjust Setup Crop so that the edges are not visible.



1. In the OUTPUT section, select **[COMBINER]**; this lets you see both Channel 1 and Channel 2 (optional) on the output.
2. Make the Channel 1 picture smaller, as shown in the picture to the left. If you have Channel 2 installed, do the same with its picture.
3. Find the input that has the widest black edge. If the edges are not symmetrical, put the source with the widest right edge on Channel 1 and the source with the widest left edge on Channel 2.
4. Hold down the **[HOME/EXIT]** pushbutton for one second. Select **{More}**, **{Eng}**, **{Setup}**, **{Video}**, and **{Crop}** to get to the Setup Crop menu.
5. Select **{Left}** and use the knob to crop the left edge of the pictures; select **{Right}** and crop the right edge. The crop settings affect both channels at once. You can also crop the **{Top}** and **{Bottom}** edges if desired.

The Setup Crop setting is saved in battery-backed-up RAM, just like the timing settings.

Black Setup (NTSC only)

The DPM-700 system allows you to insert and remove standard NTSC 7.5 IRE setup on the output black level.

1. Hold down the **[HOME/EXIT]** pushbutton for one second. Select **{More}**, **{Eng}**, **{Setup}**, **{Video}**, and **{Setup}** in turn.

   The second **{Setup}** selection turns black setup on and off alternately.

   - When the selection name appears in all capital letters—**{SETUP}**—setup will be automatically inserted on the output black level.
   - When the selection name appears with lowercase letters—**{Setup}**—setup will not be inserted on the output black level.

   When you have made your selection, exit the menu by holding down **[HOME/EXIT]** for one second. The Black Setup status is saved in battery-backed-up RAM, just like the timing settings.

SAVING YOUR SETUP TO DISK

When you have finished adjusting your Setup parameters—timing, Setup Crop, and Black Setup—it is a good idea to save your settings to disk. They are already saved in battery-backed-up RAM, but the disk gives you extra protection and allows you to have different Setups which you can recall as needed. Also, be sure your key frame parameters are set up the way you want them, and saved as the Default Keyframe in the **{Eng}** menu before you save to disk. Save everything to disk as follows:

1. Hold down **[HOME/EXIT]** for one second. Select **{Disk}** and then select **{Save}**. The name of the currently selected disk file will appear in the upper left-hand corner of the display, followed by a period (.) and then three letters which identify the file type:

   BASE NAME.TYPE

2. A blinking cursor will appear over one of the base name's characters.
   - Turn the soft knob to change the character.
   - Press the pushbuttons under **{<}** and **{>}** to move the cursor to another character in the name.

3. When you have entered the file base name you want, press **{Type}** until the type name **{SUP}** (setup) appears, as follows:

   BASE NAME.**SUP**

   Press **{Save}** to save your setup to disk. You can recall it to the DPM-700 later as follows:
   - Select **{Disk}** and then **{Recall}**;
   - Enter the file base name and type as before (or use the **{<<}** and **{>>}** pushbuttons to scan through all the existing file names);
   - Press **{Recall}**.

Complete instructions for using the disk drive are given in the DPM-700 Operator's Handbook.

OPERATIONAL CHECKOUT

Now that you have finished physical installation, cabling, and timing, you are ready to perform an initial operational checkout. The purpose of this checkout is to allow you quickly to confirm that your DPM-700 is properly functioning before installing any options you may have. A full operational checkout is called for after all options are installed. Although this checkout is optional, it is strongly recommended.

The specifics of the initial operational checkout are up to your own discretion, based on the list below and based upon what you find yourself as you explore the "Tutorial—Basic Effects" section of the DPM-700 Operator's Handbook. We suggest you try the following:

√ Sizing (Squeezing) a Picture
√ Locating (Positioning) a Picture
√ Spinning a Picture in 3D
√ Rotating a Picture in 3D
√ Skewing (Slanting) a Picture
√ Aspect Adjustment of a Picture
√ Perspective Adjustment
√ Direct Entry of X, Y, and Z Values
√ Trimming X, Y, and Z Values
√ Detent Values
√ Creating a Key Frame Effect
√ Learning (Saving) Your Effect Into E-MEM®
√ Running and Reviewing Key Frame Effects
√ Changing the Key Frame Duration Time
√ Inserting (Adding) a Key Frame Into an Effect
√ Deleting a Key Frame from an Effect
√ Replacing a Key Frame in an Effect with a New Key Frame
√ Using the Key Layer Menu to check upstream/downstream modes
√ Using the Keyer and Lever Arm to Key-in Manipulated Images over Background Video (downstream mode)
√ Solarization, Posterization, and Background Matte and External Background
√ Placing a Border Around a Picture
√ Fade-to-Black Feature

If you discover any operational problems, please contact your distributor for warranty service.

OPTION INSTALLATION

This subsection explains how to plan for and install all the optional equipment for the DPM-700. The subsection assumes that all steps of the standard installation procedures have been done correctly. None of the options require un-racking the frame, nor do they need additional software to be installed, but some do require additional set-up procedures using the standard software.

General Information About the Options

The subsection begins with some general instructions which apply to all options. Next, a quick-reference list of all the options is given so you can swiftly locate and skip to those options pertinent to your situation. Finally the subsection containing the detailed instructions for each option is given, including set-up, if any, using the STREAMLINE™ softpanel, plus an operational checkout of just that option.

Options Not Received at the Time of the Basic DPM-700 System

If an option is ordered after installation of the DPM-700, instructions may come with that option and supersede the instructions contained in this section.

CAUTIONS

1. To prevent circuit and connector damage, always turn off system power before inserting or removing modules or installing options. When finished with installation, leave the Module Restrict Bar in the closed position to help guard against removing modules with power on.

2. Prevent electrostatic discharge damage to sensitive equipment by grounding yourself and your equipment and observing precautions given for each option.

3. To prevent equipment damage from incorrect installation, follow all instructions precisely and thoroughly.

Quick Reference List of Options

The option installation instructions are organized according to the popularity of each option, with the most popular first. They include the following:

1. Second Channel
2. Recursive Memory
3. 10-by-1 Input Selector
4. Cable Fabrication Kit (frame-to-panel)
5. Spare Power Supply
6. Disk Remote Kit
7. Control Panel Rack-Mount Kit

The Second Video Channel Option

This DPM-700 option provides a complete second channel for transforming video and/or key signals. It is identical to the standard first channel and is available for either analog or digital inputs, regardless of your existing Channel 1 input format. Adding a second channel not only doubles video handling capabilities, but also multiplies effects possibilities through channel combination.

The second channel's transformations can be combined with the first channel's transformations in a variety of ways. This makes possible such advanced effects as layering (overlapping) and dissolving, or blending between channels — effects which are not possible with just one channel.

Use as a Dedicated Key Channel

With a second channel, you can designate one of the video paths of either channel as a "dedicated key signal path." You can take advantage of this feature using a character generator or any other video source that outputs a matched key signal with its output video. The source video can be connected to either the A or B input of one channel and the matched key signal to either the A or B input of the other channel.

The role of each channel can be dynamically changed on a keyframe-by-keyframe basis using the STREAMLINE™ soft panel.

Analog Input Key Signal Specifications: When an analog channel is used for dedicated key signal processing, the key signal arriving at the input of the DPM-700 must meet certain specifications:

1. Key amplitude must be 714 millivolts (NTSC) or 700 millivolts (PAL).
2. The key signal must be blanked according to the NTSC composite video standard.
3. Sync is not required but is preferred.
4. Burst is not needed but can be accommodated.
5. Setup (NTSC only) is not needed but can be accommodated.

What the Second Channel Option Consists Of

This option consists of three pieces:

1. an Input Submodule appropriate to your requirements;
   - NTSC Analog—064705
   - NTSC Digital—064726
   - PAL Analog—064735
   - PAL Digital—064727
2. a second Digital Video Processor Module (064741);
3. a Combiner Submodule (064704).

No additional software is needed. The same simple set-up procedures are required for Channel 2 as for Channel 1, using the STREAMLINE™ soft panel for setting input timing, phase, and cropping.

The only cabling required is the connection of your additional video and/or key signal source equipment to the DPM-100's Channel 2, Input A and B connectors.

Second Channel Installation Procedure

CAUTIONS

(1) Before removing or inserting a module from or into the frame, turn OFF the ac power switch on the front left of the frame (position "O"). If power is left on, permanent major damage from arcing and/or power surges can occur.

(2) Before touching any module, be sure to ground yourself to discharge any electrostatic charges. Otherwise, damage to sensitive components can occur.

Refer to Figure 2-15 and proceed as follows:

1. Loosen the two screws in the Module Restrict Bar which blocks the front left edge of the modules. Slide it up and to the left and temporarily tighten it in the open position to allow removal of the module.

2. Using the ejector tabs, remove the Interface Module (064702—NTSC, 064722—PAL) from the bottom slot and place the module on an electrostatically protected surface where you can work on it.

3. Plug the Input Submodule into the proper space on the Interface Module. Make sure the connectors seat completely.

CAUTION

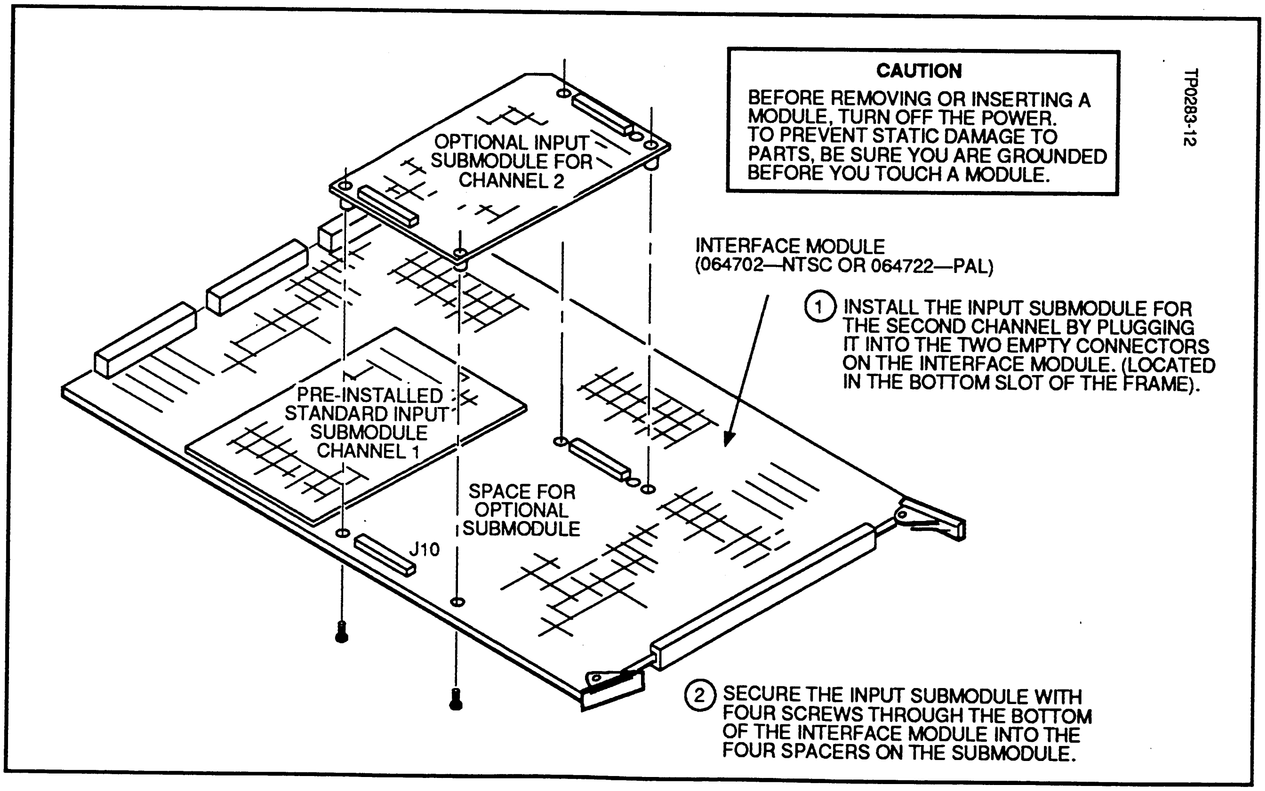
Be sure to properly orient the Input Submodule, being careful not to offset the connectors as you connect it to the Interface Module. Note the cut-off corner as a guide and make sure the screw holes line up properly. Reversing the submodule can damage the equipment.

4. Secure the submodule using the four screws and spacers provided. **If the screws are difficult to align, be sure the submodule is mounted properly.** Do not over-tighten or you may crack either the submodule or the module.

5. Carefully reinsert the Interface Module back into its slot in the frame, making sure that it seats fully in the frame with its edge flush with the other modules.

6. Insert the second channel Digital Video Processor Module (064741) into the second slot from the top, making sure that it seats fully in the frame with its edge flush with the other modules (see Figure 2-16).

7. Observing the same cautions about electrostatic discharge as with the Input Submodule, remove the Control Processor Module from Slot 1 (the top slot) of the electronics frame, and place the module on a non-conductive, electrostatically-protected surface where you can work on it.


OPTIONAL INPUT SUBMODULE FOR CHANNEL 2
PRE-INSTALLED STANDARD INPUT SUBMODULE CHANNEL 1
SPACE FOR OPTIONAL SUBMODULE
J10
INTERFACE MODULE (064702—NTSC OR 064722—PAL)
TP0283-12

CAUTION
BEFORE REMOVING OR INSERTING A MODULE, TURN OFF THE POWER. TO PREVENT STATIC DAMAGE TO PARTS, BE SURE YOU ARE GROUNDED BEFORE YOU TOUCH A MODULE.

① INSTALL THE INPUT SUBMODULE FOR THE SECOND CHANNEL BY PLUGGING IT INTO THE TWO EMPTY CONNECTORS ON THE INTERFACE MODULE. (LOCATED IN THE BOTTOM SLOT OF THE FRAME).

② SECURE THE INPUT SUBMODULE WITH FOUR SCREWS THROUGH THE BOTTOM OF THE INTERFACE MODULE INTO THE FOUR SPACERS ON THE SUBMODULE.

Figure 2-15. Installing the Second Channel Input Submodule

8. Plug the Combiner Submodule into the Control Processor Module, as shown in Figure 2-17, making sure the connectors mate completely.

9. Secure the Combiner Submodule with the four screws and spacers provided.

10. Reinsert the Control Processor Module into the frame, firmly seating its rear connectors so that its front edge is flush with those of the other modules.

11. Lock the modules in place by returning the Module Restrict Bar to its original position and tightening the screws to hold it in place.

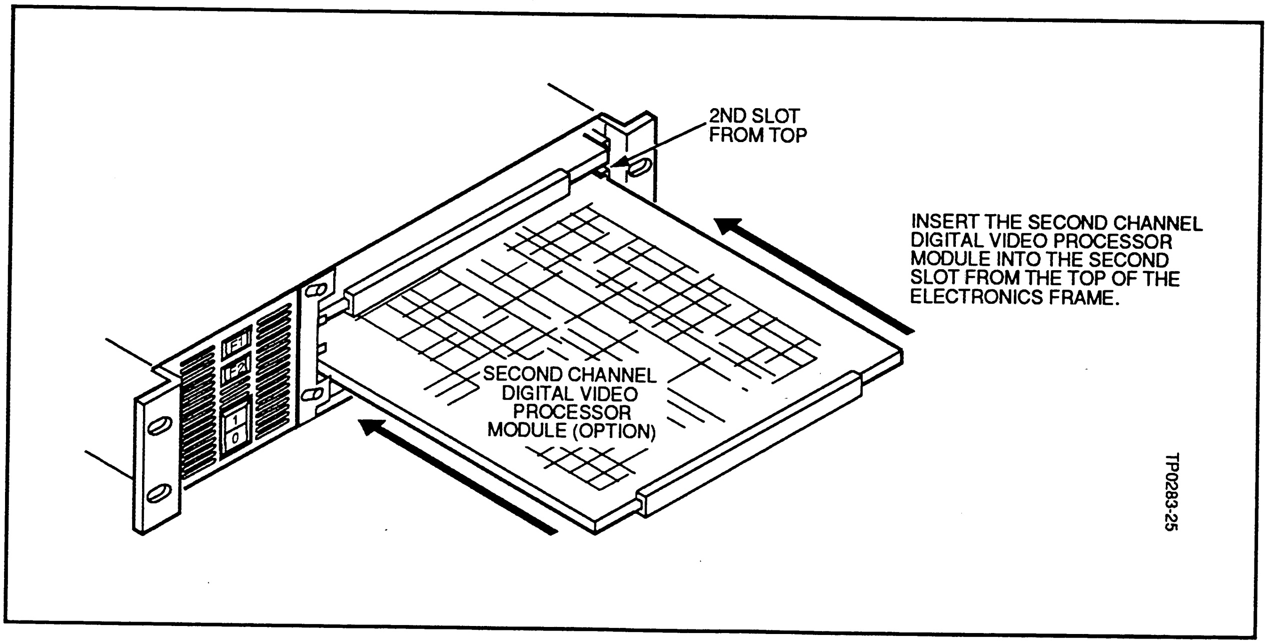

2ND SLOT FROM TOP
INSERT THE SECOND CHANNEL DIGITAL VIDEO PROCESSOR MODULE INTO THE SECOND SLOT FROM THE TOP OF THE ELECTRONICS FRAME.
SECOND CHANNEL DIGITAL VIDEO PROCESSOR MODULE (OPTION)
TP0283-25

Figure 2-16. Installing the Second Digital Video Processor Module

After installation and power-up, the microprocessors of the DPM-700 will automatically sense the presence of the Second Channel Option and make it operational. However, for the second channel to work properly, you will need to recable and perform some set-up procedures using the STREAMLINE™ soft panel.

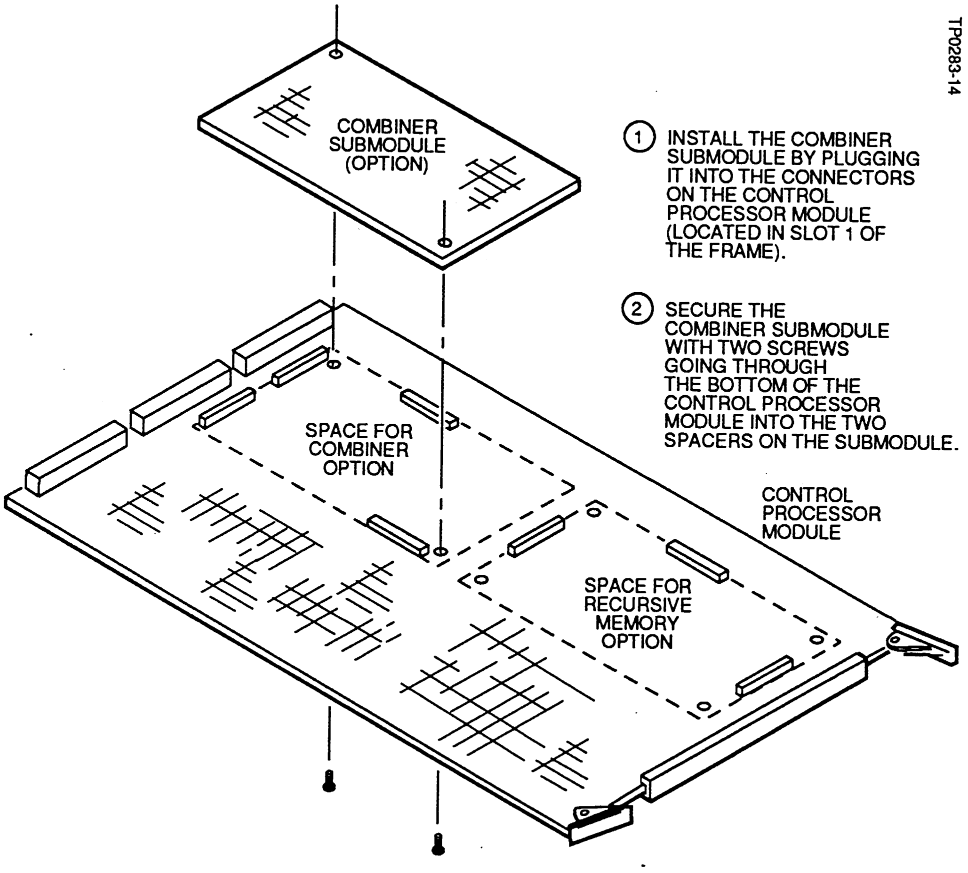

TP0283-14
COMBINER SUBMODULE (OPTION)
① INSTALL THE COMBINER SUBMODULE BY PLUGGING IT INTO THE CONNECTORS ON THE CONTROL PROCESSOR MODULE (LOCATED IN SLOT 1 OF THE FRAME).
② SECURE THE COMBINER SUBMODULE WITH TWO SCREWS GOING THROUGH THE BOTTOM OF THE CONTROL PROCESSOR MODULE INTO THE TWO SPACERS ON THE SUBMODULE.
SPACE FOR COMBINER OPTION
CONTROL PROCESSOR MODULE
SPACE FOR RECURSIVE MEMORY OPTION

Figure 2-17. Installing the Combiner Submodule

Cabling for the Second Channel Option

With the Second Channel module and input submodule installed, the Channel 2 A and B inputs become active. For a second channel with an analog input submodule, connect input video to analog looping connectors J22 and J23 on the back of the DPM-700. For a digital input submodule, connect to digital inputs J13 and J14.

If you intend to use an analog input selector for Channel 2, such as the GVG TEN-X®L series or GVG's DPM-733, see the heading "10x1 Input Selector Option" in this section.

Start-up Test for the Second Channel

1. Turn ON the DPM-700 ac power switch (position "1"), located behind the front cover at the front left of the electronics frame. The unit will go through the same start-up conditions as described under "Initial Power-up" in this section.
2. Select Channel 2 in the DELEGATION area of the control panel. This will place your Channel 2, Input A source on the Program Output. Make sure your source device is sending out a video or key signal.
3. If this test is successful, go on to Set-up Procedures. If not, retrace your steps through these procedures to find the problem. If you need assistance, contact Grass Valley Group Customer Service.

Set-up Procedures for the Second Channel

Like the standard Channel 1 set-ups, these procedures consist of using the STREAMLINE™ soft panel to establish the input video horizontal timing, color phase, and cropping. Refer to "TIMING ADJUSTMENTS" and "TIMING PROCEDURE", later in this section.

Recursive Memory Option

Overview

Recursive means to "write again." The Recursive Memory option adds a full frame of memory to the DPM-700 system and gives the operator the ability to do effects in which a picture is stored so that its image can be retained on screen as new pictures are added, producing a multiple-image effect over time. Examples of recursive effects are montage, trails, star trails, decays, strobes, and various timed effects. The operator can choose to recurse at field rate or at frame rate to achieve different effects.

The Recursive Memory Option consists of a two-layered submodule (064703) and miscellaneous mounting hardware, as shown in Figure 1. The top layer consists of three small printed circuit boards which contain RAM components. The lower level of the submodule is the processing circuitry which stores, retrieves, and processes the video and key signals being recursed. The submodule installs on the Control Processor Module (064700) in the electronics frame. The system microprocessors sense the presence of the submodule and transparently reroute appropriate signals to and from it.

Recursive Memory Step-by-Step Installation

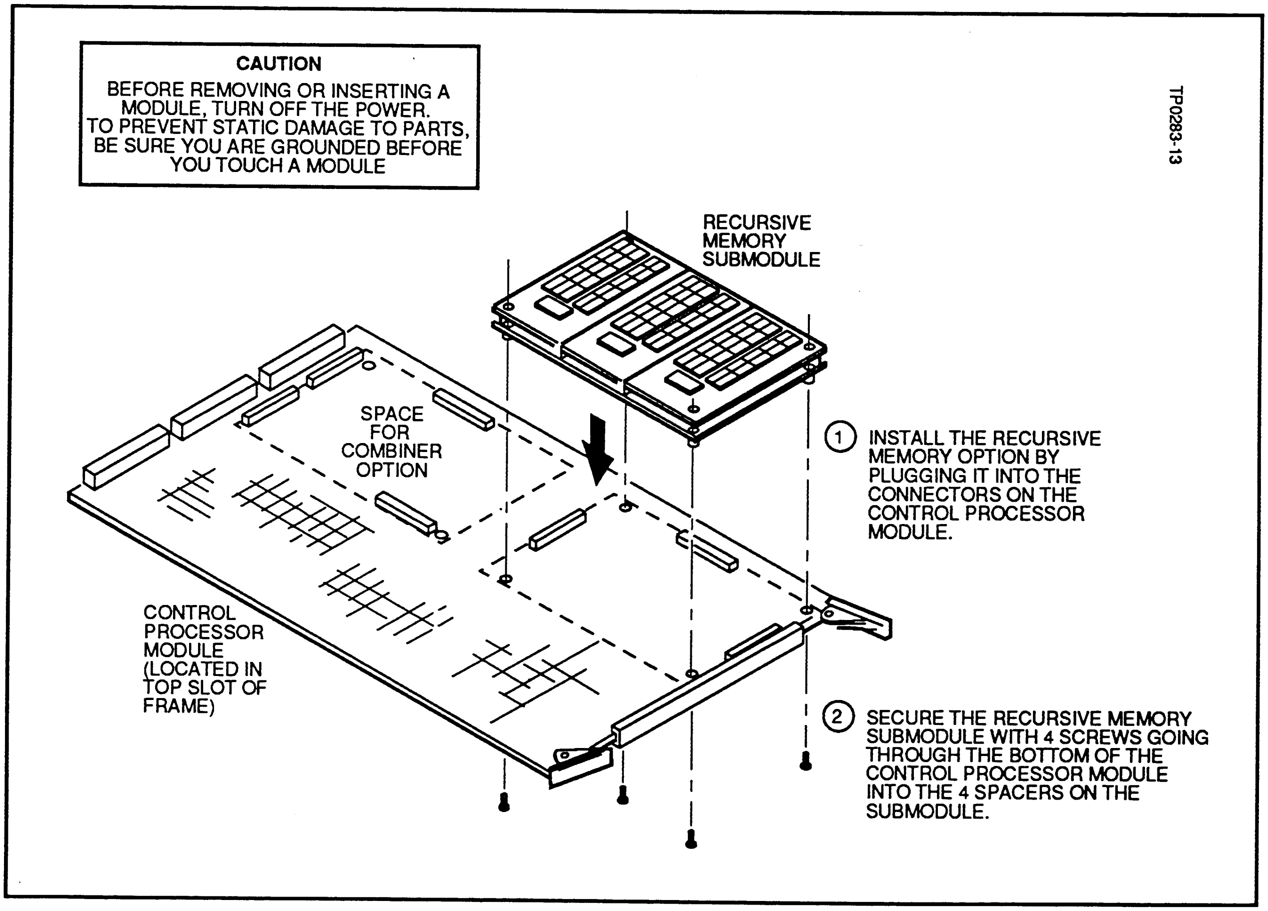
CAUTIONS

(1) Before removing or inserting a module, turn OFF the ac power switch on the front left of the frame (position "0"). If power is left on permanent major damage from arcing and/or power surges can occur.

(2) Before touching any module, be sure to ground yourself to discharge any electrostatic charges or damage to sensitive components can occur.

Refer to Figure 2-18 and proceed as follows:

1. Loosen the two screws in the Module Restrict Bar which blocks the front left edge of the modules. Slide it up and to the left and temporarily tighten it in the open position to allow removal of the module.
2. Using the ejector tabs, remove the Control Processor Module from the top slot and place the module on an electrostatically protected surface where you can work on it.
3. Plug the Recursive Memory Submodule into the proper space on the Control Processor Module. Be sure you are plugging into the three connectors for the Recursive Memory Option and not the four connectors for the Combiner Option. Make sure the connectors seat completely.


TP0283-13
RECURSIVE MEMORY SUBMODULE
SPACE FOR COMBINER OPTION
CONTROL PROCESSOR MODULE (LOCATED IN TOP SLOT OF FRAME)

CAUTION
BEFORE REMOVING OR INSERTING A MODULE, TURN OFF THE POWER.
TO PREVENT STATIC DAMAGE TO PARTS, BE SURE YOU ARE GROUNDED BEFORE YOU TOUCH A MODULE

① INSTALL THE RECURSIVE MEMORY OPTION BY PLUGGING IT INTO THE CONNECTORS ON THE CONTROL PROCESSOR MODULE.

② SECURE THE RECURSIVE MEMORY SUBMODULE WITH 4 SCREWS GOING THROUGH THE BOTTOM OF THE CONTROL PROCESSOR MODULE INTO THE 4 SPACERS ON THE SUBMODULE.

Figure 2-18. Installing the Recursive Memory Submodule Option

4. Secure the submodule using the four screws and spacers provided. **If the screws are difficult to align, be sure the submodule is mounted properly**. Do not overtighten, or you may crack either the submodule or the module.

5. Carefully reinsert the Control Processor Module back into its slot in the frame, making sure that it seats fully in the frame.

6. Lock the modules in place by returning the Module Restrict Bar to its original position and tighten the screws to hold it in place.

7. Turn the power switch ON (position "1"), and wait for the control panel to come up in its normal start-up state.

Operational Checkout

The best test for determining that the Recursive Memory option is working properly is to try some of the special effects detailed in the Advanced Effects section of the Operator's Handbook. These effects are mostly controlled via the STREAMLINE™ Recursive menu.

If you are unable to perform any of the recursive effects, turn the power OFF and check that the Recursive Memory Submodule is mounted properly, then reseat the electronics frame modules. If this doesn't solve the problem, contact Grass Valley Group Customer Service at (916) 478-3359.

10x1 Input Selector Option

Model Numbers:
DPM-733
Plus—All GVG®
TEN-X®L -Series
Routing Switchers

Overview

NOTE: These installation instructions take precedence over those found in the "TEN-X®L Series Installation Guide and Operator's Handbook", which is shipped with the Input Selector Option. Please start with these instructions and refer to the TEN-X®L Series Installation Guide and Operator's Handbook" when instructed to do so.

The DPM-733 Input Selector Option is specifically designed to work with the DPM-700, or you can adapt a TEN-X®L Router to perform the same function. In either case, a single input selector provides a total of 8 additional video inputs to the DPM-700. (Input B becomes disabled when an input selector is installed in a channel). If desired, two input selectors can be installed—one feeding input A of each channel (if you have the Second Channel Option) to provide a total of 16 additional video inputs. The Input Selector Option does not need its own control panel because it is controlled remotely by selections in the DPM-700 STREAMLINE™ menu.

The option consists of three main standard parts:

1) a rack-mounted analog input selector unit, external to the DPM-700, which:

2) a triple-legged control cable with D-type, 25-pin connectors used for enabling the DPM-700 to control the input selector(s) and an optional TTY diagnostic terminal. Also included are new pushbutton caps for the DPM-700 Input pushbuttons.

3) an ac line input cord, with appropriate connectors, according to the utility line specifications determined by the model number (110 or 240 vac).

NOTE: The video output cable needed for connecting the output of the input selector to the DPM-700, is to be provided by the customer. It should be made of standard video-quality coaxial cable with a male BNC connector on each end.

Input Selector Step-By-Step Installation

NOTES: These steps are geared for the installation of just one input selector. The procedures for installing two units are essentially the same except where noted. Some adaptation by the installer may be needed.

WARNING

Lethal electricity exists inside the frame of the input selector, on the power supply module.

CAUTIONS

1. Make sure that the ac power is off for both the DPM-700 and for the input selector before installation, or damage to the equipment may occur.

2. To prevent equipment damage, verify that the input selector is set for the correct ac line voltage and that it contains the correct ac fuse for your studio. To do so, please refer to the "TEN-X®L Series Installation Guide And Operator's Handbook".

3. Guard against electrostatic discharge when connecting cables to the input selector and to the DPM-700. Discharge(s) can damage internal components.

1. Unpack the input selector, checking for damage to the shipping carton and/or to its contents. Inform the delivery company of any damage, and they will advise you how to proceed.
2. Compare the packing list with the actual contents to ensure that you received what you ordered.
3. Refer to Figure 2-19, and prepare for rear support using the side plates and back plates provided:

A. On each side of the frame, remove the four screws holding each side plate and back plate.

B. Considering the depth of the input selector versus the depth of your rack, slide each plate toward the rear of the frame so that it can remount in a set of screw holes which will allow the side plate to protrude through its back plate by at least 1/2 inch (about 1 cm).

C. Replace and firmly tighten the screws.

D. Allowing for 1 rack-unit of vertical space, firmly attach the back plates to the rear of the rack, oriented as shown in Figure 2-19, using the screws provided. (This step is not optional. Support needs require the use of the back plates.)

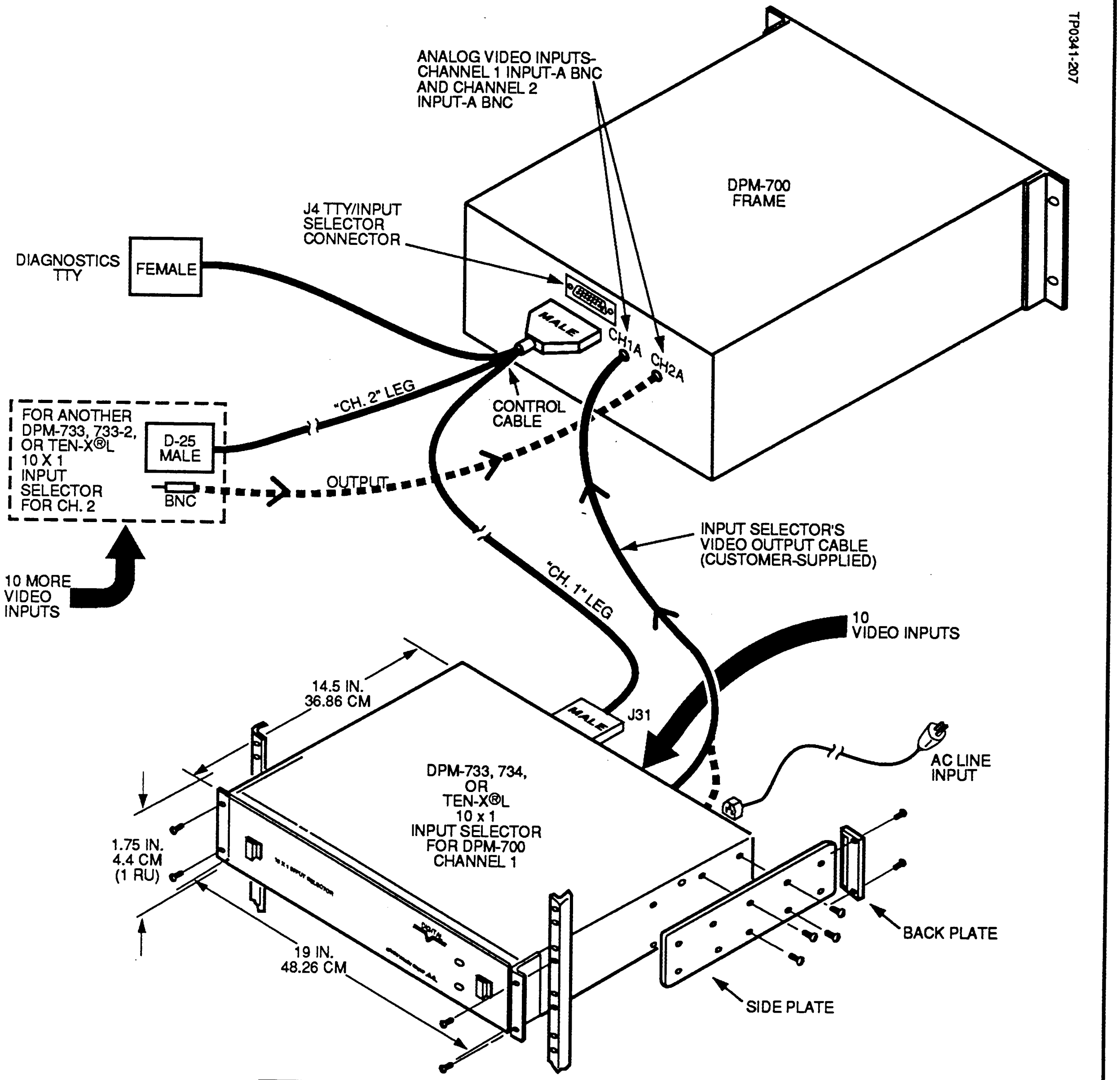
The back plates should be located on the rear rack rails so that the screw holes in the back plates will line up with the holes on the front rack rails where the input selector will fit. Failure to match up the holes in the back plates with the corresponding front holes will prevent the input selector from mounting properly.

4. Rack-mount the input selector. It weighs about 6.8kg/15lbs. Be careful not to hurt your back as you lift it into position. Tightly secure the front of the unit to the rack using the four screws provided.

5. Next connect the tripple-legged remote control cable as shown in Figure 2-19, with the ac power off on all units:

A. On the backplane of the DPM-700, connect the base D-25 connector (male) of the cable to J4, labeled TTY/INPUT SELECTOR , and secure with the screws built in to the connector. It is important that this connection does not come loose while the ac power is on, or damage may result.

B. The shortest leg of the cable is for connection to a TTY-type terminal for running diagnostics. The other two legs are the same length and have very similar use, so be careful not to con-


TP0341-207
ANALOG VIDEO INPUTS-
CHANNEL 1 INPUT-A BNC
AND CHANNEL 2
INPUT-A BNC
DPM-700
FRAME
J4 TTY/INPUT
SELECTOR
CONNECTOR
DIAGNOSTICS
TTY
FEMALE
MALE
CH1A
CH2A
"CH. 2" LEG
CONTROL
CABLE
FOR ANOTHER
DPM-733, 733-2,
OR TEN-X®L
10 X 1
INPUT
SELECTOR
FOR CH. 2
D-25
MALE
BNC
OUTPUT
INPUT SELECTOR'S
VIDEO OUTPUT CABLE
(CUSTOMER-SUPPLIED)
10 MORE
VIDEO
INPUTS
"CH. 1" LEG
10
VIDEO INPUTS
14.5 IN.
36.86 CM
MALE
J31
AC LINE
INPUT
DPM-733, 734,
OR
TEN-X®L
10 x 1
INPUT SELECTOR
FOR DPM-700
CHANNEL 1
1.75 IN.
4.4 CM
(1 RU)
19 IN.
48.26 CM
BACK PLATE
SIDE PLATE

CABLING	CNTRL CABLE LEG TO J31 ON INPUT SELECTOR:	OUTPUT CABLE TO DPM-700 BNC:
FOR USE ONE CHAN. 1 -	"CHAN. 1....."	CHANNEL 1 INPUT A (NOT INPUT B)
FOR USE ONE CHAN. 2 -	"CHAN. 2....."	CHANNEL 2, INPUT A (NOT INPUT B)

Figure 2-19. Installing the 10x1 Input Selector(s)

fuse them. Check their labels in accordance with the following:

C. The center leg is labeled near its male D-25 connector: "Chan. 1 router J31". Connect it to J31, labeled REMOTE CONTROL, on the backplane of the input selector you will be using on Channel 1 of the DPM-700. Secure it with the connector screws. It is important that this connection does not come loose while the ac power is on, or damage may result.

D. If you are not going to use an input selector for Channel 2 of the DPM-700, you will want to neatly coil or otherwise store and protect the unused leg of the cable. Especially guard against shorting any of the pins on the loose male connector. Please go on to the next step.

   If you are going to use an input selector for Channel 2 of the DPM-700:

   1) First make sure the ac power to the second input selector is off.

   2) Connect the final leg of the control cable (see its label) to J31 of the second input selector, likewise labeled REMOTE CONTROL.

   3) Secure the connector with the connector screws; it is important that this connection not come loose while the ac power is on, or damage may result.

6. Connect a customer-supplied video output cable from one of the OUTPUT BNCs of the input selector to the DPM-700 A input of the desired channel. Be sure the input selector connected to the Channel 1 leg of the control cable is the same one that you are connecting to the Channel 1 A input and similarly for Channel 2.

7. Connect input video cables to the BNC connectors on the input selector(s).

8. Tally connections are not usable with the DPM-700, since they are only "active" if the Tally option is installed in the input selector and no options are being offered with the DPM-733 & DPM-733-2 Input Selectors.

9. For power supply failure alarm connections, please see the "TEN-X®L Installation Guide".

10. The timing method for the input selector can be either "internal" or "external" as determined by a jumper inside the input selector. The jumper should have been pre-selected at the factory. If you want to verify the jumper setting, please refer to the "TEN-X®L Installation Guide". The timing setting may also be referred to as the vertical interval strobe setting.

11. For initial power-up please refer to the "TEN-X®L Installation Guide" for instructions about selecting the correct ac input voltage and connecting the ac line input cord. After following those procedures for initial power-up on the input selector, please return to these procedures for further instructions.

CAUTION

Equipment damage may result if you connect ac power to the input selector without first setting it for the correct ac line voltage.

12. With the input selector properly powered-up, next power-up the DPM-700 by turning on the power switch on its frame (to position "1").

    The control panel should come up in its start-up state (explained earlier under Initial Power-up in the Standard Installation subsection), and you're ready to set-up your DPM-700 (using the STREAMLINE™ softpanel) for use with the input selector(s).

Input Selector(s) Software Setup

Set-up of the DPM-700 to handle the input selector(s) is done using the DPM-700's STREAMLINE™ softpanel on its control panel. The set-up procedures apply to the specific channel(s) of the DPM-700 you wish to delegate for use with a TEN-X®L input selector (details follow).

Recall that you can choose to connect and use one or two input selectors with your DPM-700 system. In either case, remember that when a particular channel is set-up for use with a TEN-X®L input selector, Input B of the channel is deactive (unusable). Later, if the channel is set-up for use without a TEN-X®L input selector, its Input B again becomes active (usable).

If you want to connect and use just one input selector, it can be connected to and used on either channel, but the proper leg of the control cable must be used (as explained), the output cable from the input selector must be connected to the correct input connector on the DPM-700, and the chosen channel must be set-up (using the softpanel) for handling the input selector.

If you want to connect and use two input selectors (one on each channel of the DPM-700), two separate but identical set-ups must be made—one for Channel 1 and the other for Channel 2.

Set up Steps:

1. With the DPM-700's control panel in its start-up (default) state, and in the DELEGATION section of the panel, select either 'CH 1' or 'CH 2' , depending upon which channel you want to set-up for the given input selector; if you are going to set-up both channels for use with a TEN-X®L input selector, it doesn't matter which you delegate first.

2. Now from the top level of the STREAMLINE™ menu, press the {MORE} soft key, then {PERSON} (Personality).

3. Select {Router} and then {Ten xl} (for the TEN-X®L input selector). When you do, the display will change so that the selection is capitalized {TEN XL} indicating that the delegated channel is now set up for that purpose.

   This completes the setup procedure for using an input selector on just one channel of the DPM-700.

   To reverse the setup (cancel the change): simply select {TEN XL} again. The selection will change to {Ten xl}, indicating that the setup is off for the input selector on that channel. You can toggle back-and-forth without limit.

   To set up the other channel for an input selector also, simply repeat the steps just performed for the first channel, beginning with Step 1, delegating a particular channel....

Internal Changes: After a channel is set up for an input selector, the DPM-700 disables that channel's Input B. It also activates new STREAMLINE™ menus for accessing the additional inputs (i.e., controlling the input selector. This change is explained in detail in the DPM-700 Operator's Handbook.

Operational Checkout

To be sure that your DPM-700 and input selector(s) are working properly together, please see the DPM-700 Operator's Handbook, Advanced Effects section for instructions. Basically, assuming the video inputs to the input selector(s) are working and delivering active video for selection, you want to make sure that the DPM-700 is able to select among those inputs from its control panel according to your selections.

Also, you might want to check that you can indeed change the set-up of the DPM-700 back to the non-TEN-X®L mode.

Problems?

This completes the installation procedures for the 10x1 Input Selector Option. If you have problems, please refer to the TEN-X®L Series Maintenance Manual and/or the Maintenance section of this manual. If you cannot resolve the problem, contact your distributor for service; do not attempt repairs yourself as they may invalidate your warranty.

Cable Fabrication Kit

The Frame-to-Panel Cable Fabrication Kit does not require special instructions. For connector pinouts and wiring, refer to the cable wiring diagram in the Drawings section of this manual.

Spare Power Supply

Power supply servicing is explained in the Maintenance section of this manual. Please refer to that section for details of removing and installing the power supply.

Disk Remote Kit

General Description

The DPM 152 Disk Remote Kit allows you to remotely mount the DPM 3.5 inch disk drive in a standard 19-inch rack. A 6' cable is provided with the Disk Remote Kit to interconnect the DPM Control Panel and the remoted disk drive.

When planning where to locate the disk drive, you should take into account that a certain amount of cable will be used to route it out of the mounting enclosures.

Remotely mounting the disk drive will be required whenever the disk drive opening in the left side of the Control Panel is blocked, either by adjacent equipment or by the method of Control Panel installation.

If you are installing the Control Panel in a rack or console you must make sure that you are using the correct Control Panel Rack-Mount Adaptor for your DPM model. Model DPM-753 for the DPM-700

The Disk Remote Kit is included as part of the Rack Mounting Option.

The Option Consists Of:

- Rack Front Panel.
- Top Cover.
- Bottom Cover.
- 6' Shielded Cable.
- Cable Adapters (ribbon cables with connectors).
- Connector Bracket, slotted (to cover disk drive opening and provide a connector mount).
- Miscellaneous screws, nuts, and washers.

Installation

What's Needed Before Starting Installation:

- Read ALL Instructions And Precautions before starting!
- The Disk Remote Kit (DPM-752)
- A Phillips screwdriver
- Nut driver, socket, or wrench

Installation (Continued)

CAUTION

Turn off all power at the front of the Electronics Frame before disconnecting any cables from the Control Panel or continuing with this procedure.

1. Turn system AC power off before proceeding further.The AC switch is located behind the front cover of the Electronics Frame. ("0" equals OFF).
2. After Power is off, disconnect the frame-to-panel cable and the TTY cable, if used, from the back of the Control Panel.
3. Remove the Disk Drive from the Control Panel:
   a. Turn the Control Panel upside-down on a padded surface and remove the eight outermost screws along the back and front edges of the panel, see Figure 2-20.

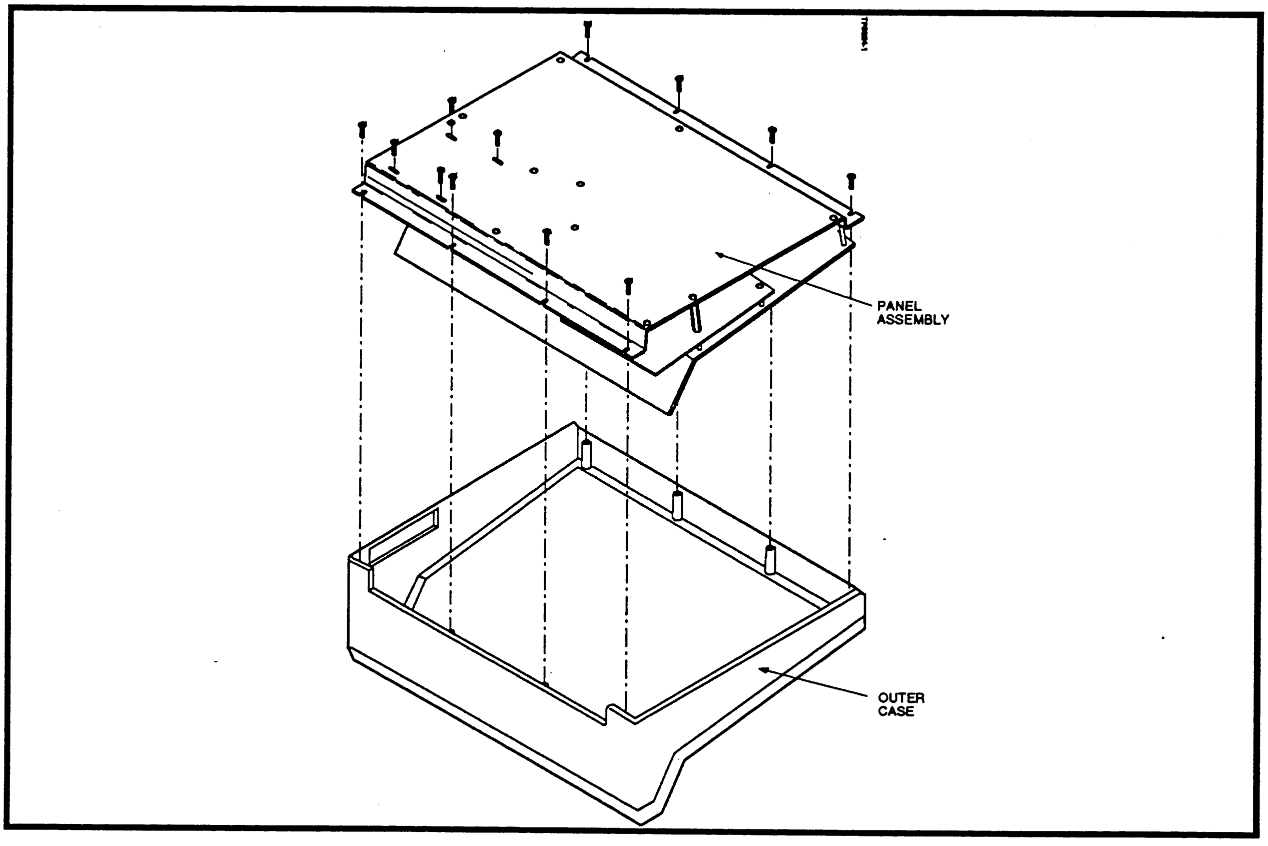


Figure 2-20. Control Panel Outer Case Removal

b. Remove the four screws on the bottom of the panel that hold the disk drive in place.

c. Hold the Outer Case and the panel assembly together and gently turn the whole assembly over (right-side up).

d. Push the disk drive inward, so that it will not interfere with removal of the outer case, and lift the outer case off of the panel assembly.

CAUTION

Guard against any sudden jar or bump to the disk drive or it may be damaged.

e. From the back of the panel assembly, disconnect the disk drive ribbon and power cables from J5 and J4 on the Control Processor Module.

f. Remove the disk drive from the panel assembly and remove the short ribbon and power cables from the drive.

4. As shown in Figure 2-21, attach one of the cable adapters to the connector bracket with the index slot facing up.

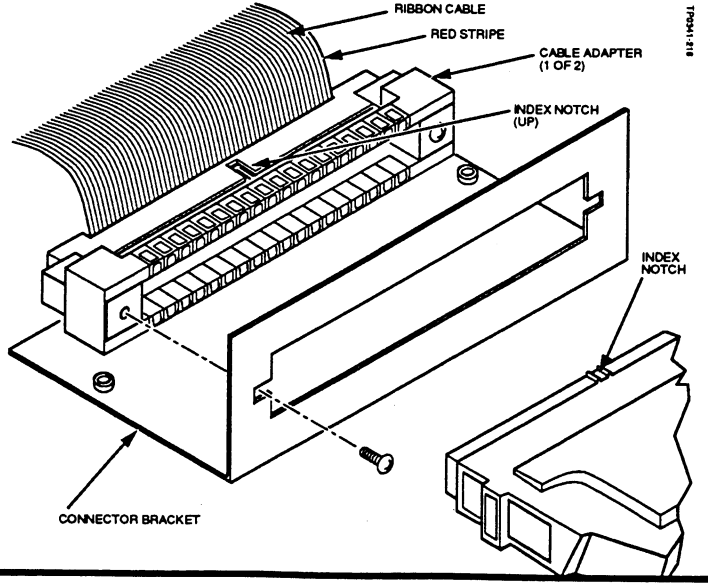

RIBBON CABLE
RED STRIPE
CABLE ADAPTER (1 OF 2)
INDEX NOTCH (UP)
INDEX NOTCH
CONNECTOR BRACKET
TP0341-218

Figure2-21. Connector Bracket and Adaptor.

5. Place this assembly into the side of the Control Panel where the disk drive was removed.

   a. Connect the signal ribbon cable to J5 with the red index mark toward the front of the control panel.

   b. Connect the three-pin power cable connector to the power plug on the Control Panel Processor Module. (Pin 2 is keyed to prevent incorrect connection.)

   c. Tilt the Control Panel up on edge and attach the Connector Bracket through the disk drive slots near the disk drive opening with the screws provided. Do not tighten screws completely at this time.

7. Reassemble the Control Panel by reversing the order of the previous steps.

8. Slide the Connector Bracket out against the opening and tighten the mounting screws.

9. Attach the remaining Cable Adaptor to the opening in the rear of the disk drive Bottom Cover, with the index notch facing Down, as shown in Figure 2-22.

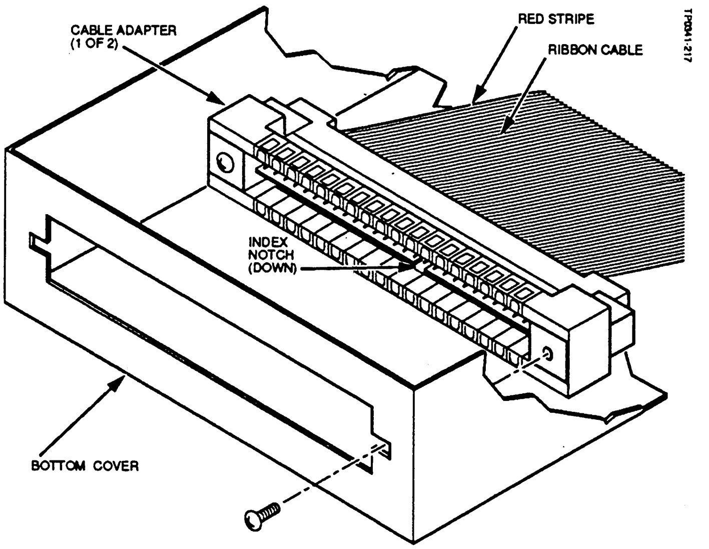


Figure2-22. Bottom Cover and Cable Adapter.

NOTE: When connecting the data and power cables to the disk drive it may be necessary to cross or put a curl in them, depending on the drive manufacturer, to correctly align pin 1 (See Figure 2-23).

10. Set the disk drive into the Bottom Cover but do not install mounting screws yet.

11. Connect the data ribbon cable to the drive, with the red stripe aligned to pin 1, see Figure 2-23.

CAUTION

The data ribbon cable connector is not keyed. The drive will not operate properly if the pin orientation is incorrect. Ensure proper alignment by referring to the following diagrams. Depending on the manufacturer of the drive, pin 1 will be located on the inside or outside of the disk drive connector.

12. Refer to Figure 2-23 and connect the power cable to the back of the drive. (Pin 2 is keyed to prevent improper orientation).

13. Attach the disk drive to the Bottom Cover using the screws removed during disassemble.

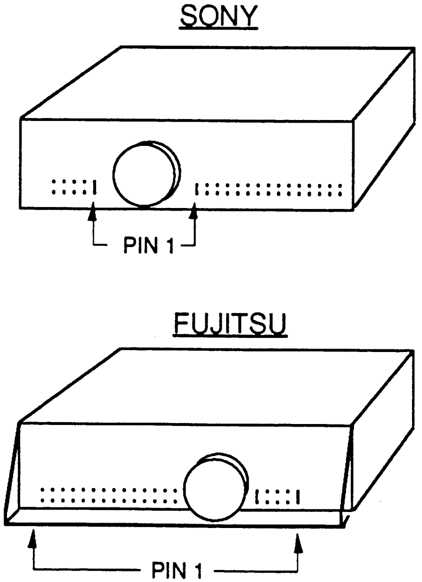


Figure 2-23. Disk Drive Pin 1 Locations, by Manufacturer

NOTE: Do not tighten the screws at this time.

14. Fold the cables on top of the disk drive, taking care not to crimp them, and then install the Top Cover, as shown in Figure 2-23a.

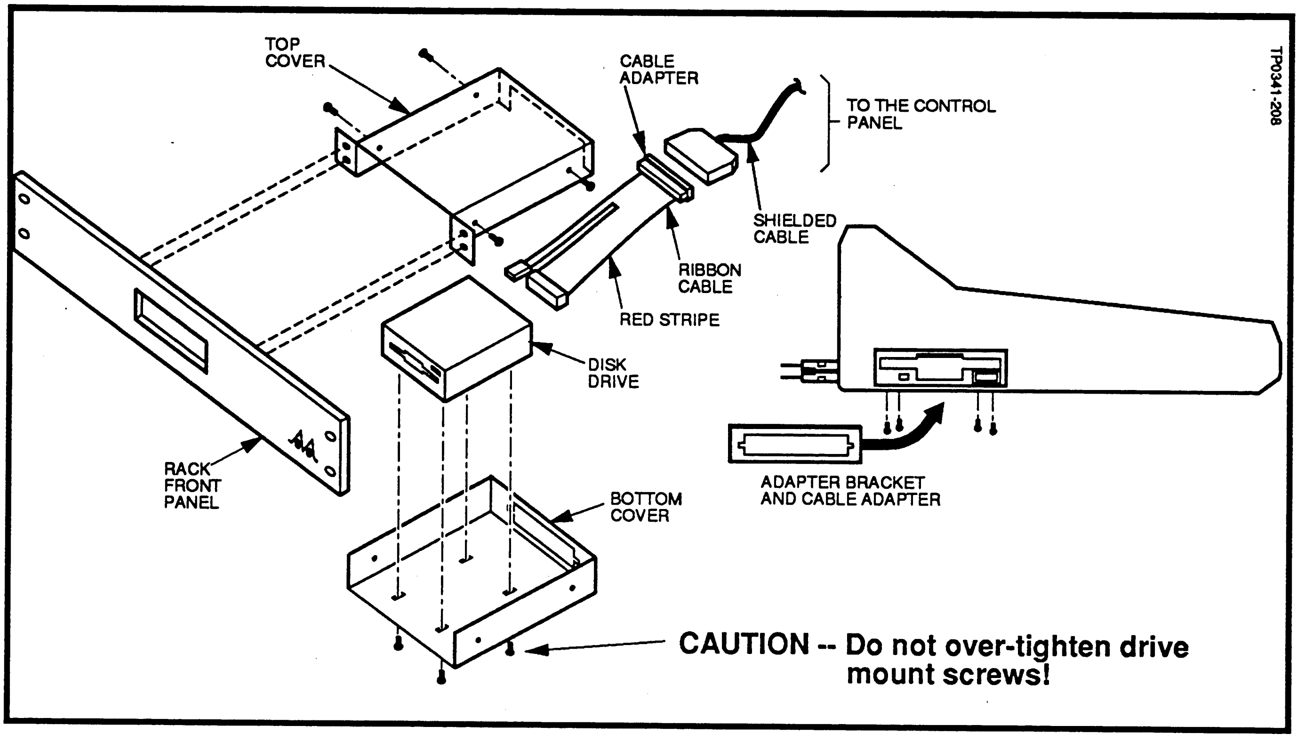

TOP COVER
CABLE ADAPTER
TO THE CONTROL PANEL
TP0341-208
SHIELDED CABLE
RIBBON CABLE
RED STRIPE
DISK DRIVE
RACK FRONT PANEL
BOTTOM COVER
ADAPTER BRACKET AND CABLE ADAPTER
CAUTION -- Do not over-tighten drive mount screws!

Figure 2-23a. Remote Disk Drive Assembly

15. Place the Top Cover over the disk drive and Bottom Cover and attach the top and bottom covers with the screws provided.

16. Attach the disk drive assembly to the Rack Mount Panel by placing it onto the mounting studs, then installing the lock washers and tightening the nuts provided.

17. Slide the disk drive forward into the opening in the Rack Front Panel then carefully tighten (Do Not Overtighten!) the drive mounting screws.

CAUTION

Do not overtighten the disk drive mounting screws! Only tighten the screws snug with finger tips using a small screwdriver. Overtightening will damage the threads in the disk drive.

18. Place the Disk Drive/Rack Front Panel assembly in the rack and secure it using standard rack-mounting hardware (not provided).

19. Install the Control Panel assembly according to the instructions, as required by your application.

> **CAUTION**
>
> **Do not restore power to the system until all cables have been reconnected between the Electronics Frame and the back of the Control Panel.**

20. When the Control Panel is installed, connect the TTY cable (if used) and the frame-to-panel cable to the back of the Control Panel.

21. Connect one end of the shielded cable to the back of the remoted disk drive assembly, with the notch DOWN. Press firmly to ensure that the connector is properly seated.

22. Route the other end of the shielded cable to the Control Panel, taking care not to make bends that are too sharp and could damage the cable.

23. Connect the free end of the cable to the connector (where the disk drive was mounted) at the side of the Control Panel. Ensure that the index notch is UP and press firmly to seat the connector properly.

24. After all cables are installed, reapply AC power to the system by placing the AC power switch, located behind the front cover of the Electronics Frame, to the On (1=On) position.

25. Conduct a complete system check-out to ensure proper operation of the DPM.

Control Panel Rack-Mount Kit

The DPM-753 Control Panel Rack-Mount Option provides all of the necessary hardware to either (1) rack-mount your Control Panel; or (2) mount your Control Panel into a cutout (hole) in a console or countertop. A rack installation requires eight rack-units of space (about 35.3 cm or 14 inches).

The left mounting plate of the Control Panel Rack-Mount Option prevents access to the disk drive when used in application (1) or (2) above. Because of this, the DPM-752 Disk Remote Kit is included as part of the Control Panel Rack-Mount Option. It allows you to remote the 3-1/2-inch disk drive into one rack-unit of space in a standard 19-inch equipment rack adjacent to the control panel.

The Disk Remote Kit cable is six feet long. When planning where to locate the disk drive, you should take into consideration that some of the cable length will be used routing it out of the enclosure.

What the Option Consists Of

Control Panel Rack-Mount Option:
- __ 1 Bottom Mounting Plate
- __ 1 Left Mounting Plate
- __ 1 Right Mounting Plate
- __ miscellaneous hardware (screws)

Disk Remote Kit:
- __ 1 Rack Front Panel
- __ 1 Top Cover
- __ 1 Bottom Cover
- __ 1-6' Shielded Cable
- __ 2 Cable Adapters (ribbon cables with connectors)
- __ 1 Connector Bracket, slotted (to cover disk drive opening and provide a connector mount)
- __ miscellaneous screws, nuts, and washers

What's Needed Before Starting

- __ the Control Panel Rack-Mount Kit (DPM-753)
- __ the Disk Remote Kit (DPM-752)
- __ Phillips screwdriver
- __ nut driver, socket, or wrench
- __ **read all cautions before installing**

CAUTION

Turn off power before disconnecting any cables from the DPM-700 control panel.

Control Panel Rack-Mount Installation Procedure

1. For removal of the disk drive and assembly of the Disk Remote Kit, refer to the "Disk Remote Installation Procedure" and follow steps 1 through 19. When finished with step 19, continue with step 2 of this procedure.

2. Referring to Figure 24, attach the Bottom Plate to the bottom of the control panel with the three no. 8 screws provided.

3. There are three possible mounting positions, as shown in Figure 24 A, B, and C:
   - A Standard rack-mount position
   - B Console mount with control panel surface parallel to the desk top
   - C Console mount with the control panel surface at its normal 6° angle.

4. Note that there are three cutouts, two in one Mounting Plate, and one in the other. Make sure that the cutout aligns with the cable connector in the side of the control panel for the mounting position you choose. Attach the Side Plates to the bottom plate using the self-tapping screws (beveled tip) provided. Use the holes appropriate to the mounting position required, as shown in A, B, or C.

5. If you are installing the Control Panel in a rack, follow Figure 24, A. Use standard rack-mounting hardware (not provided).

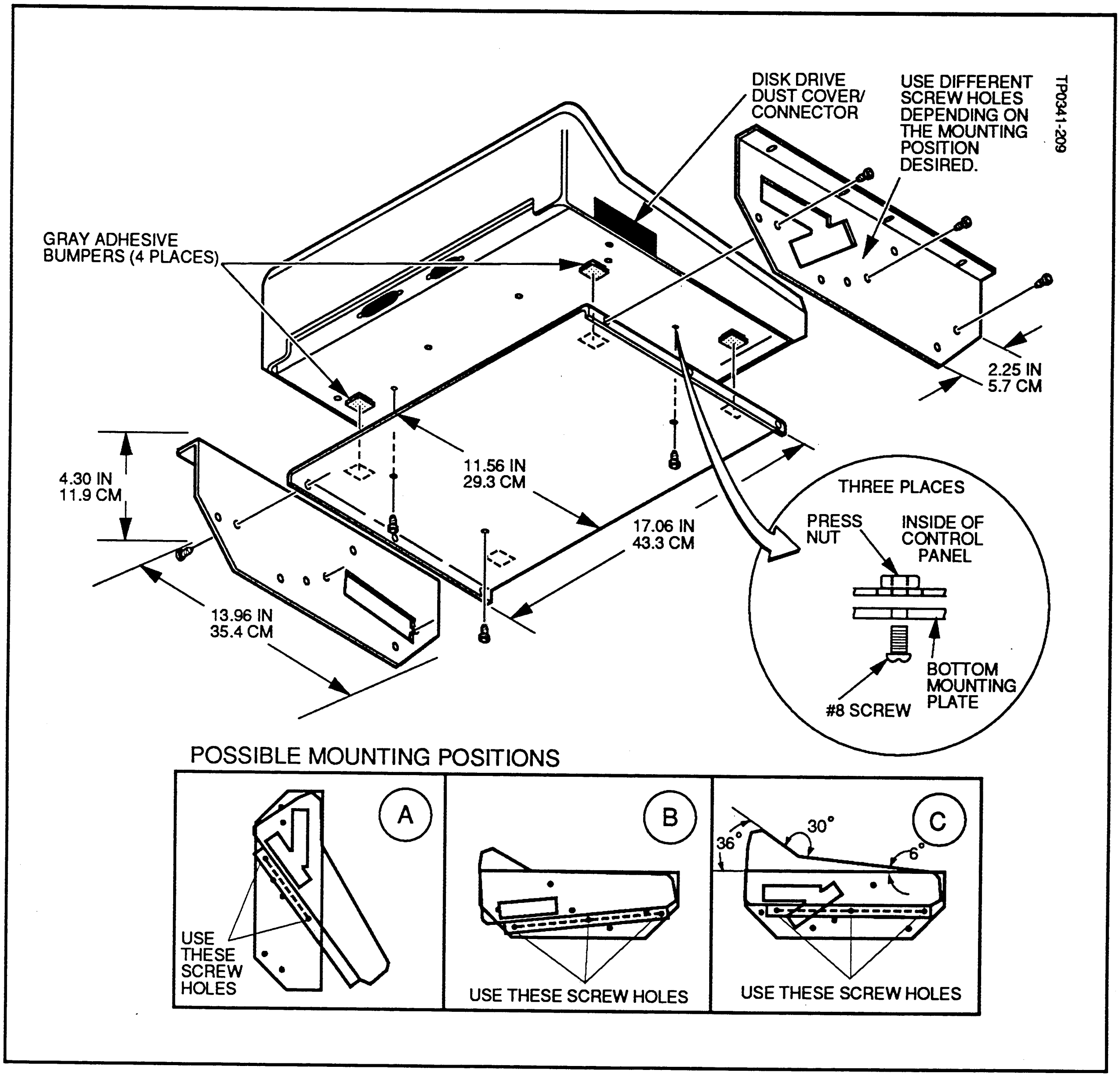

DISK DRIVE DUST COVER/ CONNECTOR
USE DIFFERENT SCREW HOLES DEPENDING ON THE MOUNTING POSITION DESIRED.
TP0341-209
GRAY ADHESIVE BUMPERS (4 PLACES)
2.25 IN 5.7 CM
4.30 IN 11.9 CM
11.56 IN 29.3 CM
THREE PLACES
PRESS NUT
INSIDE OF CONTROL PANEL
17.06 IN 43.3 CM
13.96 IN 35.4 CM
BOTTOM MOUNTING PLATE
#8 SCREW
POSSIBLE MOUNTING POSITIONS
A
USE THESE SCREW HOLES
B
USE THESE SCREW HOLES
C
36°
30°
6°
USE THESE SCREW HOLES

Figure 2-24. Attachment of Control Panel Mounting Plates

6. If you are installing the Control Panel in a console or desk-top, see Figure 25. To flush mount the Side Plates, use the routing dimensions given in the expanded cross-section. Attach the Control Panel assembly to the console/desk-top with the appropriate screws (not provided).

CAUTION

Do not restore power to the system until the frame-to-panel cable has been connected to the back of the Control Panel.

7. When the Control Panel is installed, connect the TTY cable (if used) and frame-to-panel cable to the back of the Control Panel.
8. Connect either end of the shielded cable to the back of the remoted disk drive assembly with the index notch DOWN. Press firmly so that the latches on each side of the connector will catch.
9. Route the shielded cable to the control panel. Connect the cable at the side of the control panel with the index notch UP. Again, press firmly so that the latches will catch.
10. After all cables have been connected, apply power to the system using the on/off switch behind the front cover of the Electronics Frame. Conduct a complete system check-out.

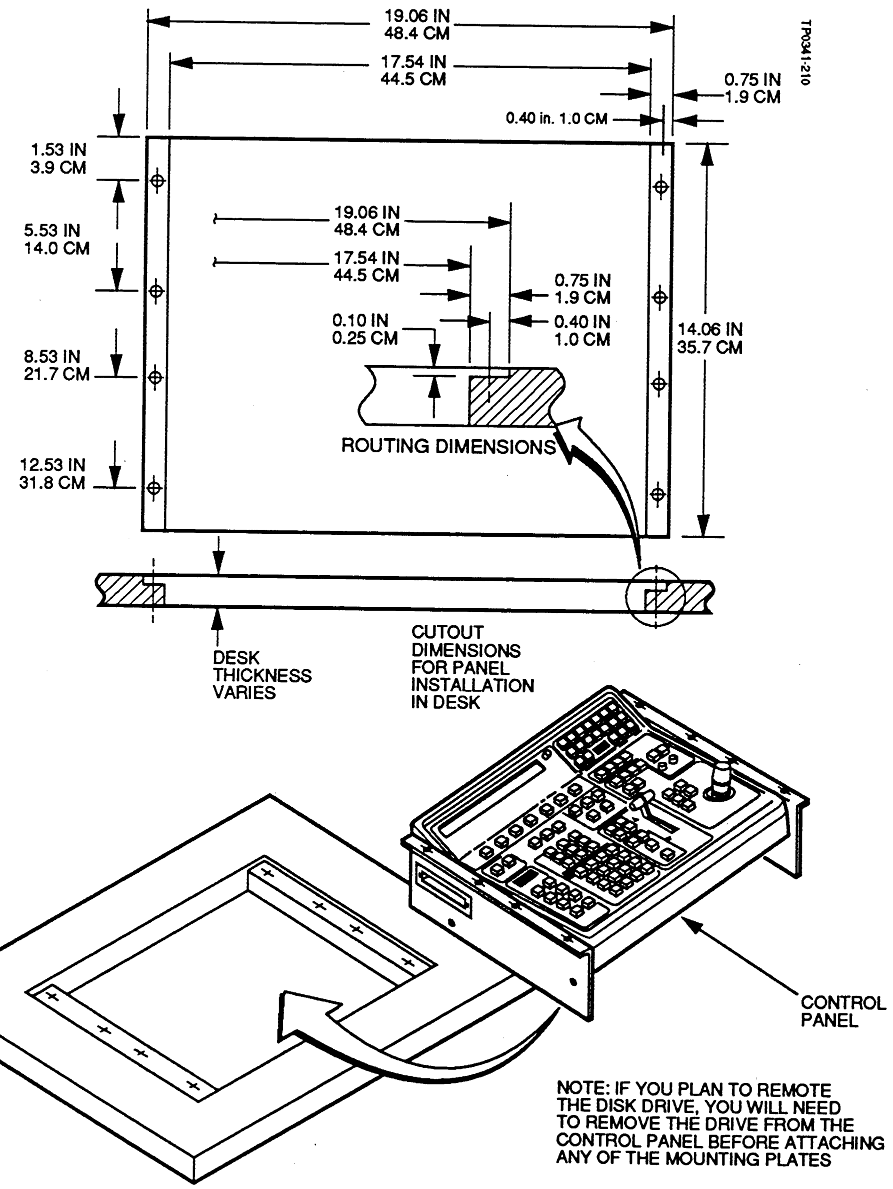

19.06 IN
48.4 CM
17.54 IN
44.5 CM
0.75 IN
1.9 CM
0.40 in. 1.0 CM
TP0341-210
1.53 IN
3.9 CM
5.53 IN
14.0 CM
8.53 IN
21.7 CM
12.53 IN
31.8 CM
19.06 IN
48.4 CM
17.54 IN
44.5 CM
0.75 IN
1.9 CM
0.10 IN
0.25 CM
0.40 IN
1.0 CM
14.06 IN
35.7 CM
ROUTING DIMENSIONS
DESK THICKNESS VARIES
CUTOUT DIMENSIONS FOR PANEL INSTALLATION IN DESK
CONTROL PANEL
NOTE: IF YOU PLAN TO REMOTE THE DISK DRIVE, YOU WILL NEED TO REMOVE THE DRIVE FROM THE CONTROL PANEL BEFORE ATTACHING ANY OF THE MOUNTING PLATES

Figure 2-25. Console/Desk-top Control Panel Mounting

INTERFACES

On the backplane of the DPM-700, connectors J1-J7 are designated for interface connections with other equipment.

- **J1 "GPI"** — General Purpose Interface Inputs and Outputs (includes Tallies)
- **J2 "Control Panel"** — Standard connection to the DPM-700's control panel
- **J3, J5, J6, and J7 "Serial Interface Ports"** — Programmable to function in several protocols
- **J4 "TTY/INPUT SELECTOR"** — This connector serves two purposes, both of which are optional: status/diagnostics using a TTY terminal; and remote control of one or two 10-x-1 Input Selectors.

The GPI Interface

J1 "GPI/TALLY" is a standard female 25 pin "D" connector. The GPI Interface includes GPI inputs and GPI/tally outputs. Chassis ground is connected to J1 at pins 6, 11, 12, 13, 18, 24, and 25.

GPI Inputs

To activate a GPI input, apply a momentary closure (for a duration of at least 2 video fields) between the COMMON pin and the desired input pin. This will trigger the function associated with that input pin, such as Fade-To-Black. All of the GPI inputs can have a function assigned to them. You assign functions to inputs using the STREAMLINE™ Display "Periph" menu.

Pin 1 of J1 is COMMON for the GPI Inputs. You can use this common as a "low" when triggering the GPI inputs through an external relay (Figure 2-26). It is electrically 100 ohms to ground.

Pins 2 through 5 and pins 14 through 17 of J1 are the GPI programmable inputs. Figure 2-26 shows the GPI input number of each pin. The GPI inputs are numbered 0 through 7.

The functions that can be assigned to the inputs through the "Periph" menu are as follows:

- E-MEM® Recalls — When enabled and triggered, will run the effect stored in the E-MEM® register that is assigned to the triggered GPI input; please refer to the Advanced Effects section of your Operator Handbook for more information; use pin 1 as common.
- FTB (Fade-to-Black) trigger causes the DPM-700 to execute this function at its auto transition rate; the trigger comes from an editor or other remote controller; use pin 1 as common.
- RUN EFFECT trigger causes the DPM-700 to run its current effect; the trigger comes from an editor or other controller; use pin 1 as common.

GPI Outputs

The GPI/tally outputs provide output relay closures to a customer-determined circuitry for lighting tally lamps or for triggering external devices. The tallies and output triggers use a relay within the DPM-700 which will close for a minimum of two fields. The relays' maximum rating is 28 volts, 100 milliamperes, resistive load.

CAUTION

Do not apply power to the GPI outputs in excess of the relays' maximum rating of 28 volts, 100 milliamperes, or damage may occur.

The GPI output pin numbers and functions are as follows (See Figures 2-26 and 2-27):

Pin	Usage
19	Run Tally — active for the entire period while the DPM-700 is running its current effect; usually connected to a status LED, but could be used to trigger a slide projector, video tape recorder, production switcher, or other device; use pin 23 as common.

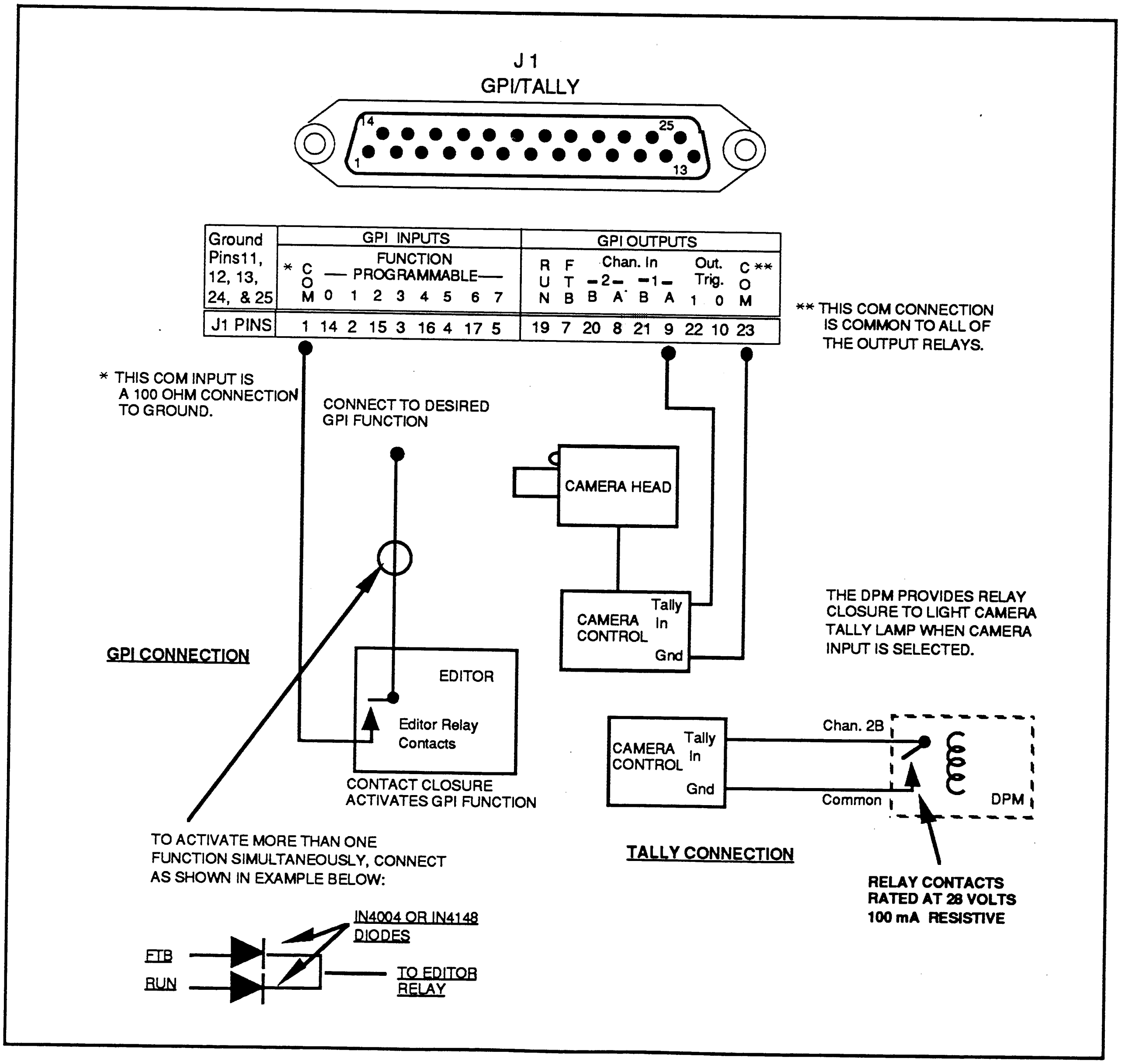

J 1
GPI/TALLY
14
25
1
13
Ground Pins 11, 12, 13, 24, & 25
GPI INPUTS
* COM
FUNCTION — PROGRAMMABLE—
0 1 2 3 4 5 6 7
GPI OUTPUTS
RUN
FTB
Chan. In -2- -1-
B A B A
Out. Trig. 1 0
COM **
J1 PINS
1 14 2 15 3 16 4 17 5
19 7 20 8 21 9 22 10 23
** THIS COM CONNECTION IS COMMON TO ALL OF THE OUTPUT RELAYS.
* THIS COM INPUT IS A 100 OHM CONNECTION TO GROUND.
CONNECT TO DESIRED GPI FUNCTION
CAMERA HEAD
CAMERA CONTROL
Tally In
Gnd
THE DPM PROVIDES RELAY CLOSURE TO LIGHT CAMERA TALLY LAMP WHEN CAMERA INPUT IS SELECTED.
GPI CONNECTION
EDITOR
Editor Relay Contacts
CONTACT CLOSURE ACTIVATES GPI FUNCTION
CAMERA CONTROL
Tally In
Gnd
Chan. 2B
Common
DPM
TALLY CONNECTION
RELAY CONTACTS RATED AT 28 VOLTS 100 mA RESISTIVE
TO ACTIVATE MORE THAN ONE FUNCTION SIMULTANEOUSLY, CONNECT AS SHOWN IN EXAMPLE BELOW:
IN4004 OR IN4148 DIODES
FTB
RUN
TO EDITOR RELAY

Figure 2-26. Tally and GPI Connections

7	FTB Tally — active for the entire period while the DPM-700 is fading to black; can be connected to a status LED and/or used to trigger a production switcher or other device; use pin 23 as common.
20	Channel 2 Input B Tally — active when this input is selected on the DPM-700's control panel; can drive the tally light(s) on a camera and/or a video monitor; use pin 23 as common.
8	Channel 2 Input A Tally—similar to pin 20
21	Channel 1 Input B Tally—similar to pin 20
9	Channel 1 Input A Tally—similar to pin 20

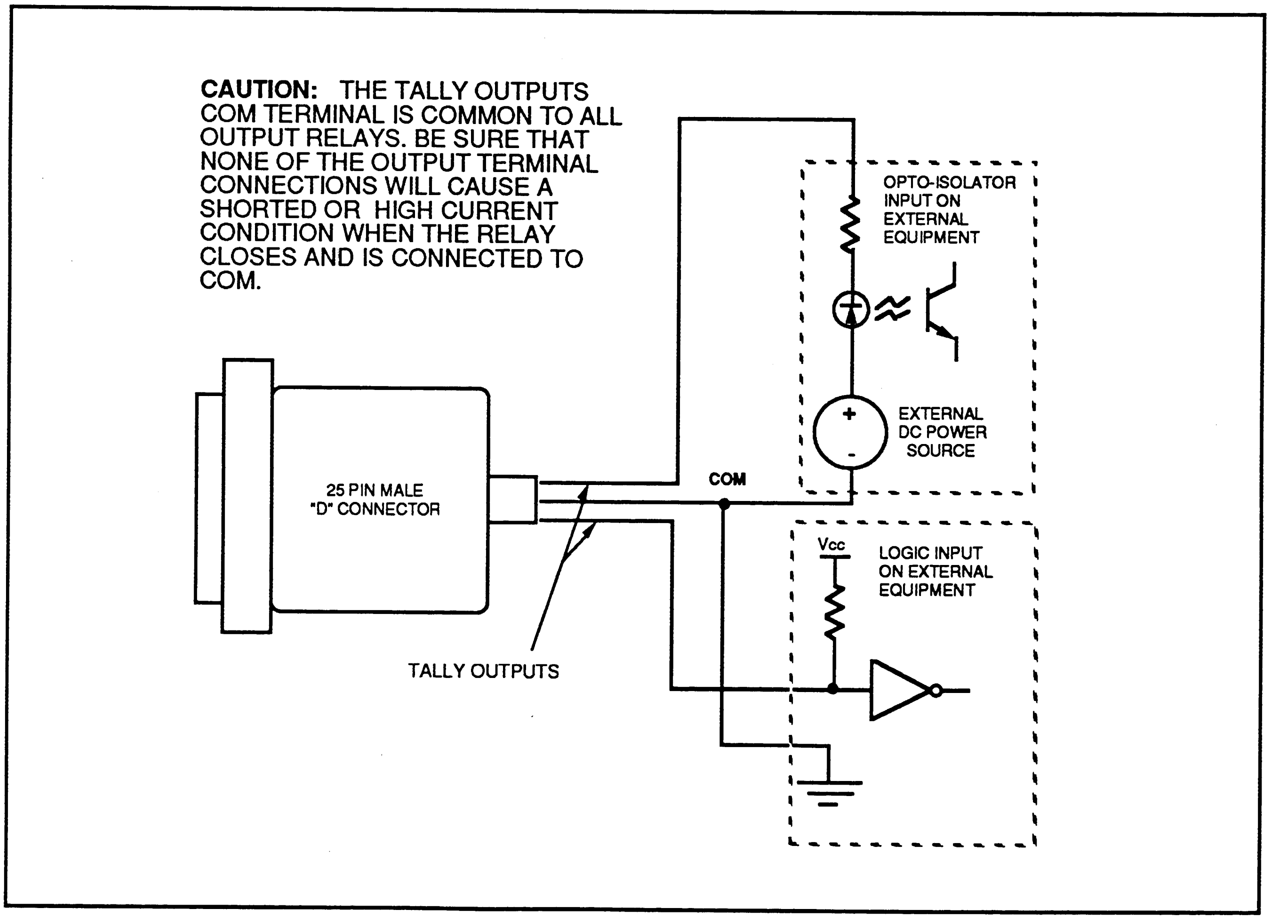

CAUTION: THE TALLY OUTPUTS COM TERMINAL IS COMMON TO ALL OUTPUT RELAYS. BE SURE THAT NONE OF THE OUTPUT TERMINAL CONNECTIONS WILL CAUSE A SHORTED OR HIGH CURRENT CONDITION WHEN THE RELAY CLOSES AND IS CONNECTED TO COM.
OPTO-ISOLATOR INPUT ON EXTERNAL EQUIPMENT
EXTERNAL DC POWER SOURCE
+
-
25 PIN MALE "D" CONNECTOR
COM
Vcc
LOGIC INPUT ON EXTERNAL EQUIPMENT
TALLY OUTPUTS

Figure 2-27. Tally Output Configuration Examples

22	Trigger Output 1— key-frameable trigger, stored in a keyframe to be fired when the effect is run.
10	Trigger Output 0 — has the same function as pin 22.
23	COMMON for GPI Outputs — an electrical connection to one side of all GPI output relays. (see Figures 2-26 and 2-27)

TTY/ INPUT SELECTOR

The TTY diagnostics function is available to those users who have a TTY terminal. Any TTY terminal that is VT100 compatible can be connected to J4 at the back of the electronics frame to display built in diagnostics information. J4 is shared by the TTY function and the 10X1 input selector function.

For details about the optional DPM-733 or TEN-X®L interfaces, please refer to the Option Installation section of this manual.

Serial Interface Ports

Grass Valley Group supports a broad range of interfaces. The DPM-700 supports five serial interface protocols via the four serial ports on the back of the electronics frame. The ports are labeled EDITOR, PERIPHERAL, ACCESSORY, and SLAVE/MODEL 100/110. The labels indicate the factory default protocol for each port, but each of them can be programmed to any one of the five protocols available.

This section of the manual describes the basic characteristics of the four serial interface ports and provides information for setting the protocols with the Diagnostics Software. For more detailed information, please refer to the DPM-100/700 Digital Picture Manipulator Protocol Manual, part number TP0463.

Port Protocol

Certain protocols have been assigned to each port at the factory. The protocol of a serial port can only be changed by using the Diagnostic Software Disk (074751). See the "Setting Communication Parameters" heading later in this section for use of that software in setting port protocol.

Factory Defaults

The factory default protocols for the ports are as follows:

EDITOR Port – ESbus Protocol

PERIPHERAL Port – Peripheral Protocol

ACCESSORY Port – Standard 100/200/300 Protocol

SLAVE/MODEL 100/110 Port – Model 100/110/200 Slave Mode

Sony Protocol can be configured to any of the serial interface ports.

Communications Standards: All of the interface ports are set up as RS-422 ports at the factory. The EDITOR port of the DPM-700 can be configured to operate as an RS-232 port. This can be done by changing the jumpers on J7 at the back of the 064700 Frame Control Processor Module in the electronics frame. The jumpers should be installed according to Table 2-2.

Table 2-2. EDITOR Port RS-422/RS-232 Jumpers

J7 pins	RS-232	RS-422
1 to 2	jumpered	open
3 to 4	jumpered	open
7 to 8	open	jumpered
9 to 10	open	jumpered

Editor and Accessory Ports

When the DPM-700 is set up in the factory default condition, an external computer/editor can exercise real-time control over the DPM-700's functions by communicating with the DPM-700 through either the EDITOR serial port (connector J3) or the ACCESSORY serial port (connector J6). The external device can control such functions as PLAY and E-MEM® (Effects Memory System) RECALL.

The EDITOR serial port supports the ESbus protocol; the ACCESSORY serial port supports the Standard 100/200/300 protocol.

Table 2-3 gives electrical and mechanical specifications for the DPM-700 EDITOR port; Table 2-4 gives specifications for the ACCESSORY port. Figure 2-28 shows a pinout for the serial port connectors.

Table 2-3. EDITOR Port (ESbus Protocol) Specifications

Connector:	9-pin "D" sub-miniature
Baud Rate:	38.4K
Parity:	Odd
Communication:	RS-422
Device Address:	80 80 Hex

Table 2-4. ACCESSORY Port (Standard 100/200/300 Protocol) Specifications

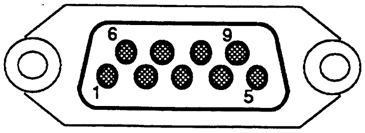
Connector:	9-pin "D" sub-miniature
Baud Rate:	38.4K
Parity:	Odd
Communication:	RS-422
Device Address:	30 Hex

RS422

SIGNAL	PIN
GROUND	1, 4, 5, 6, 9
RX+	3
RX-	8
TX+	7
TX-	2

RS232
(ONLY AT EDITOR PORT WHEN CONFIGURED FOR RS232)

SIGNAL	PIN
GROUND	1, 4, 5, 6, 9
RX	2
TX	7
NOT USED	3, 8



9 PIN D CONNECTOR

Figure 2-28. DPM-700 Serial Port Pinout

PROTOCOLS

In order to allow the DPM-700 to operate with a large variety of existing and proposed editing systems, the DPM-700 hardware has been designed to work in two different protocol formats: ESbus protocol and Standard 100/200/300 protocol.

ESbus Protocol

ESbus protocol is the factory default for the EDITOR port on the back of the DPM-700 frame. ESbus was developed specifically for the remote control of television equipment. ESbus is the joint work of the Society of Motion Picture and Television Engineers (SMPTE) and the European Broadcast Union (EBU).

The DPM-700 supports only a limited part of the ESbus protocol. To use ESbus, the DPM-700 must be the *only* device connected to the editor's serial port. The common bus consists of two twisted pairs which carry data at 38.4K baud, odd parity, RS-422 (see Table 2-2). It uses a 9-pin "D" connector.

ESbus uses a Break character as an attention signal to establish communication between a controlled device (the DPM-700) and the controller (editor/computer). This provides the greatest protection from communication errors.

Standard 100/200/300 Protocol

The Standard 100/200/300 protocol is the factory default for the ACCESSORY port on the back of the DPM-700. Grass Valley Group's Model 100 and Model 110, Model 200, and Model 300 Series switchers all use this communication protocol. It was developed when the 300 switcher was introduced and was closely based upon the past work of SMPTE (which has since evolved into the ESbus protocol).

Sony Editor Protocol

The DPM-700 can be configured to use SONY editor protocol and dialect. The DPM-700 is a controlled device when using this protocol. It will emulate a SONY-type VTR (for example, BVH-2000, BVW-10, etc.); as far as the editor is concerned, the DPM-700 is a SONY VTR.

For a full description of the protocol, please refer to the SONY publication SONY BVH-2000 SERIES, Protocol of Remote-2 (9-pin) Connector.

The communications format is as follows:
- Asynchronous
- RS-422
- Full-duplexed
- Data rate of 38.4 Kbaud
- One start bit
- Eight data bits
- Odd parity
- One stop bit

Peripheral Protocol

The DPM-700 can respond to Learn, Recall, and Trigger commands on the peripheral bus. DPM-700 users who want to write their own peripheral interface programs should refer to the DPM-100/700 Digital Picture Manipulator Protocol Manual, TP0463.

Recall, Learn, and Trigger commands can be sent via the peripheral bus to any one of the DPM-700's four programmable ports: PERIPHERAL, EDITOR, SLAVE/MODEL 100, and/or ACCESSORY. While any of these ports can be programmed for peripheral interface, normally the PERIPHERAL port is used for peripheral protocol. Programming the ports is described under "Setting Communications Parameters" in this section. The ports are always enabled.

The Peripheral Bus system consists of a single master device (usually an editor or switcher) and one or more peripheral devices. (In this manual we will use the term "editor" to represent any computer-controlled device.) The DPM-700 is always a peripheral device; it cannot send commands on the Peripheral Bus. All devices on the bus must operate at the same baud rate, parity, and communication standard (RS422). The devices operate together in such a way that they may be synchronized for frame-accurate coordination of video events. (See Figure 2-29).

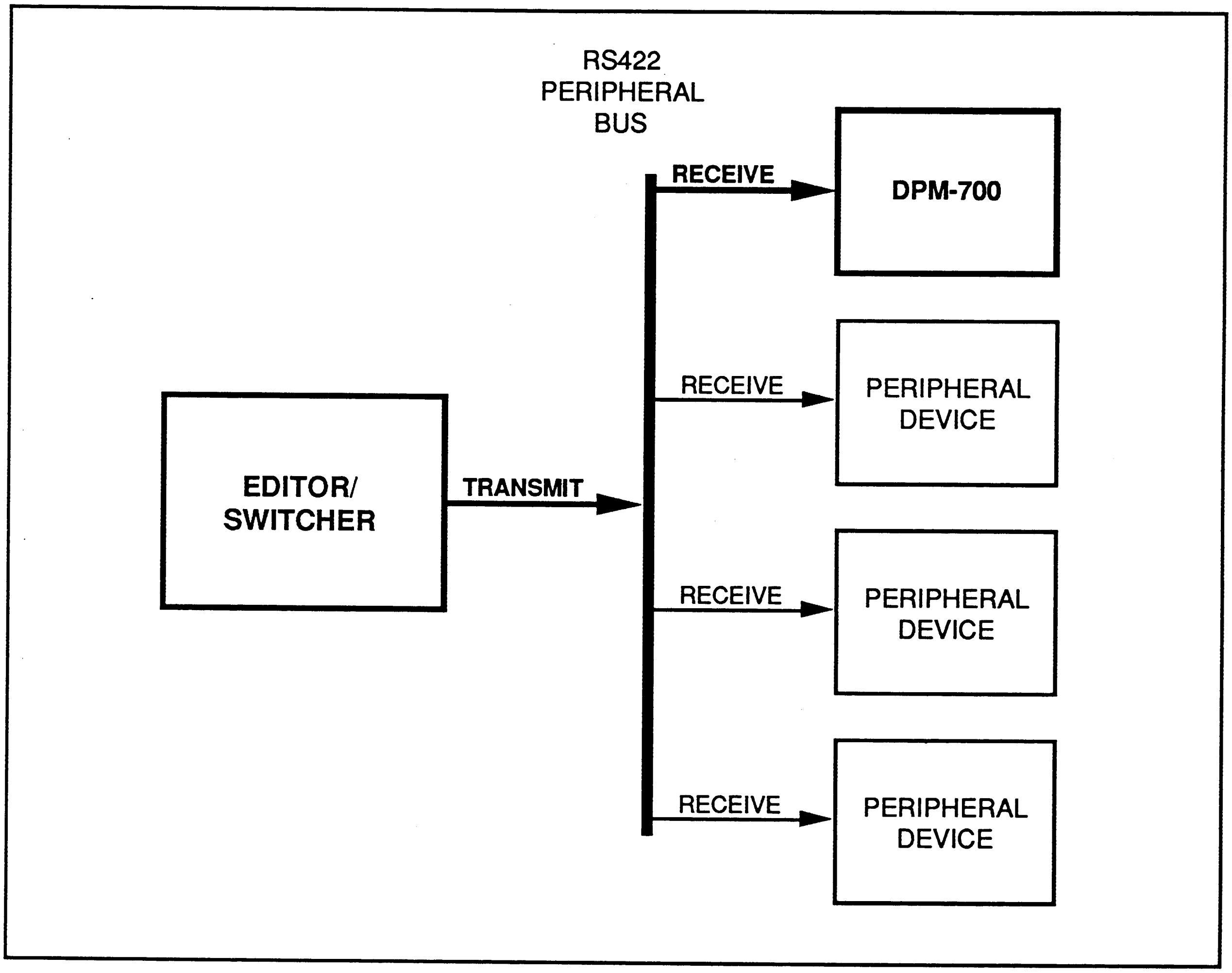

RS422
PERIPHERAL
BUS
RECEIVE
DPM-700
RECEIVE
PERIPHERAL DEVICE
EDITOR/ SWITCHER
TRANSMIT
RECEIVE
PERIPHERAL DEVICE
RECEIVE
PERIPHERAL DEVICE

Figure 2-29. Peripheral Bus System Block Diagram

Model100/110/200 Slave Mode

The DPM-700 can be used to control a Grass Valley Group Model 100, Model 110, or Model 200 Production Switcher, either in a standalone mode (no editor) or as part of an editing system. The Model 100/110 must have the Serial Interface Adapter Option installed and the Model 200 requires the Dual Serial Adapter Option.

- The DPM-700 can recall any of the switcher's E-MEM® setups on a key frame basis.
- It can trigger an automatic transition on the switcher, again on a key frame basis.
- Model 100/110 and Model 200 E-MEM® registers can be learned to and recalled from the DPM-700's disk drive.

This section describes the system connections and setup information. It also explains in detail the advantages of the interconnection to the user.

Connecting the DPM-700 to the Model 100, Model 110, or the Model 200

The DPM-700 can be connected to the Model 100, 110, or 200 switcher in two different ways, as follows:

- Standalone: DPM-700 SLAVE/MODEL 100/110 port is connected to the Model 100/110's SERIAL INTERFACE port or the Model 200's EDITOR port.
- Editing System: The DPM-700 SLAVE/MODEL 100 port is connected to the Model 100's SERIAL INTERFACE port or the Model 200's EDITOR port. The editor is connected to the DPM-700's ACCESSORY port and controls the Model 100/110/200 via the DPM-700.

Standalone Connections (no editor)

In standalone configuration, connect the DPM-700 SLAVE/MODEL 100/110 port to the Model 100/110 SERIAL INTERFACE port or the Model 200 EDITOR port. The DPM-700 can then control the Model 100/110/200 in much the same way an editor would. The DPM-700's SLAVE/MODEL 100/110 port is programmed by default to communicate with the

Model 100/110 or Model 200 using the following parameters:

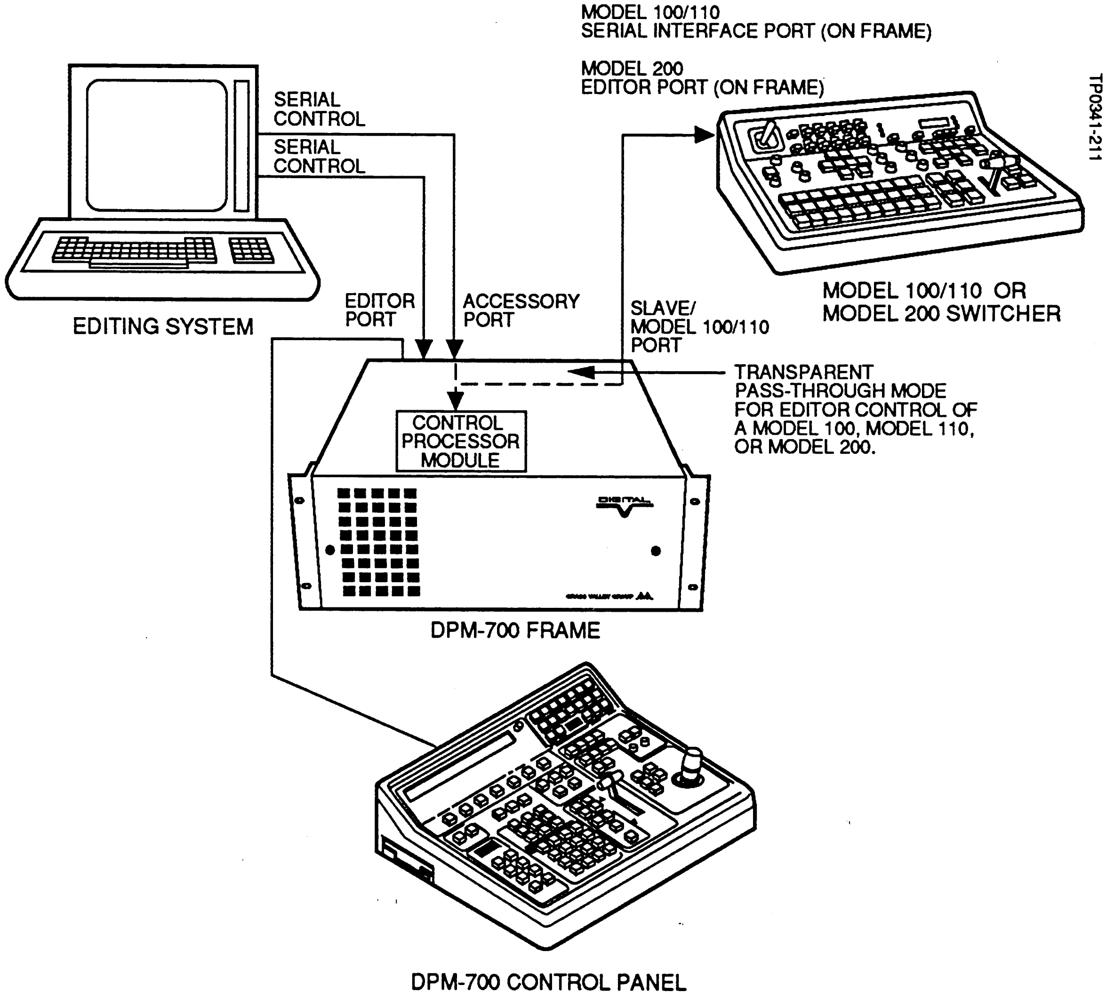
- RS-422
- Baud rate of 38.4 kbaud
- 8 bits, one stop bit, odd parity
- Model 100/110 device address of 30 hex

This default UART setup is the one used by GVG editors. Use the STREAMLINE™ display/menu system to confirm or change the settings. For port programming, refer to "Setting Communication Parameters" later in this section.

The connecting cable between the DPM-700 and the Model 100/110 or Model 200 is a special serial interface cable. The cable can be ordered through your distributor. If you prefer, you can wire your own cable according to Table 2-5:

Table 2-5. DPM-700 to Switcher Cable Pin-out

DPM-700	Name On the DPM-700 End	Switcher
PIN 1	GROUND	PIN 1
PIN 2	SIGNAL REC A	PIN 8
PIN 3	SIGNAL XMIT B	PIN 7
PIN 4	SIGNAL GROUND	PIN 4
PIN 5	NOT USED	PIN 5
PIN 6	SIGNAL GROUND	PIN 6
PIN 7	SIGNAL REC B	PIN 3
PIN 8	SIGNAL XMIT A	PIN 2
PIN 9	GROUND	PIN 9


MODEL 100/110
SERIAL INTERFACE PORT (ON FRAME)
MODEL 200
EDITOR PORT (ON FRAME)
TP0341-211
SERIAL CONTROL
SERIAL CONTROL
EDITING SYSTEM
EDITOR PORT
ACCESSORY PORT
SLAVE/ MODEL 100/110 PORT
MODEL 100/110 OR MODEL 200 SWITCHER
TRANSPARENT PASS-THROUGH MODE FOR EDITOR CONTROL OF A MODEL 100, MODEL 110, OR MODEL 200.
CONTROL PROCESSOR MODULE
DPM-700 FRAME
DPM-700 CONTROL PANEL

Default Interface Parameters

EDITOR TO DPM-700 ACCESSORY PORT AND
DPM-700 SLAVE/MODEL 100/110 PORT TO
MODEL 100/110 SERIAL INTERFACE PORT (OPTIONAL)
OR MODEL 200 EDITOR PORT:

- 100/200/300 PROTOCOL
- DEVICE ADDRESS = 30 HEXADECIMAL
- RS-422
- 38.4 KBAUD
- EIGHT BITS
- ONE STOP BIT

Figure 2-30. Pass-through Mode for Editor Control of a Model 100, Model 110, or Model 200 Switcher

Editing System Connections

The DPM-700 must be connected to the Model 100/110's SERIAL INTERFACE port or to the Model 200's EDITOR port, in order to control it, as described under the "Standalone Connections" heading. If you also want to use an editor to control a Model 100, 110, or 200 switcher, you must do so through the DPM-700, as shown in Figure 2-30.

For pass-through editor control, connect the editor to the DPM-700's ACCESSORY port. The ACCESSORY port has exactly the same pinout and connector gender as the Model 100/110's SERIAL INTERFACE port (or the Model 200's EDITOR port) in RS-422 mode. The ACCESSORY port is set up at the factory to communicate using the correct parameters for the Model 100/110, as described earlier under the "Standalone Connections" heading.

You can program the port to interface with the Model 200 using the STREAMLINE™ display menus. You can also confirm or change the settings. For port programming, refer to "Setting Communication Parameters" later in this section.

NOTE: *The device address and baud rate on the Slave / Model 100 / 110 port and the Accessory port must match. If you change one, change the other too.*

The DPM-700 uses the effects address in the Standard 100/200/300 protocol to direct the editor's messages and the Model 100/110/200 responses.

- The DPM-700's effects address is 04. Any message with an effects address of 04 will be interpreted as a message to the DPM-700 and it will respond normally.
- Any message with an effects address other than 04 will be passed through to the Model 100/110 or Model 200. The switcher will respond through the DPM-700. The time delay of a message passing through the DPM-700 from an editor to the switcher is three characters long. The time delay of the Model 100/110/200 response passing through to the editor is one character long.

The Advantages of Standalone and Editing System Configurations

In either Standalone or Editing System configuration:

- The DPM-700 can recall any of the switcher's E-MEM® setups on a key frame basis.
- It can trigger an automatic transition on the switcher, again on a key frame basis. This function is controlled through the DPM-700's "Periph/Slave" STREAMLINE™ menu.
- Model 100/110/200 E-MEM® registers can be learned to and recalled from the DPM-700's disk drive. This function is controlled through the DPM-700's "Disk" STREAMLINE™ menu.

The Editing System configuration has all of the Standalone advantages and more. In this configuration, the editor can use the Standard 100/200/300 protocol to control the switcher (in DPM-700 pass-through mode) and the DPM-700.

DPM-700 EDITOR Port

Some editors cannot be configured to use the Standard 100/200/300 dialect to control the DPM-700 through the ACCESSORY port, but they can control the DPM-700 through its EDITOR port. The EDITOR port can be configured to emulate either a SONY-type VTR or a Kaleidoscope (ESbus protocol).

The editor to DPM-700 EDITOR Port is formatted as follows (same as Kaleidoscope protocol):

- ESbus protocol
- Device address = 80 80 hexadecimal
- RS-422
- 38.4 KBaud
- Eight Bits, One Stop Bit, Odd Parity

Operational Checkout

When the cables are hooked up and the port protocols are correct, you should be able to perform the interface functions described in this section.

If your interface isn't working correctly, there are two special features for helping to determine the source of the error:

1) There are rows of LED's behind the front cover of the electronics frame at the front of the top module. The LED's at the right are the serial communication indicators (see the "Frame DC Test Points and LED Indicators" figure, Maintenance). The LED's which correspond to the port being used can be monitored while sending data between equipment. For instance, if you send an ALL STOP command from an editor, you should see the transmit and receive LED's both blink.

2) If you have a TTY terminal connected to the Status/Diagnostic terminal (J4) on the back of the electronics frame, you may access a special diagnostics screen. To do so, type "editor" <return> at your TTY terminal. This command will display a table with all of the ports listed across the top and a column of possible errors along the side. If an error is indicated, it may be helpful in solving the problem.

For further information, refer to the service manual for the equipment interfaced with the DPM-700 and the Maintenance Section of this manual.

SETTING COMMUNICATION PARAMETERS

You can set the DPM-700 communication parameters using the {Eng} menu in the STREAMLINE™ display. You will find a description of the menu selections in your DPM-700 Operator's Handbook. The following description of the Diagnostics Software Disk contains the same menu selections for port programming as found in the operating software menus (start-up with no disks installed). The menu selections are the same after the {USetup} selection.

The DPM-700 comes with a Diagnostics Software Disk (Assembly Number 074751) which allows you to select protocol types and communication parameters for the various ports: EDITOR, PERIPHERAL, ACCESSORY, and SLAVE/MODEL 100/110. You can select:

- Protocol Types: ESbus (Kaleidoscope), Standard 100/200/300, Slave, Peripheral, and Sony.
- Addresses for ESbus, Standard 100/200/300, and peripheral protocols.
- Baud rates.
- Uart Parameters: message bits, stop bits, and parity.
- Slave assignment (for use in the special slave mode of operation, described in Section 4 of this manual).

Using the Diagnostic Software Disk

This section describes the use of the Diagnostic Software Disk to set communication parameters of the serial interface ports. A complete description of other diagnostics features is located in the Maintenance Section of this manual. To use the Diagnostics Software Disk, first turn the DPM-700's power off. Insert the disk and turn the power back on. The system takes several seconds to load the diagnostics programs from the disk. During this time, the DPM-700 will be inactive except for the disk drive light.

NOTE: *In the following instructions, names appearing in curved brackets—{Name}—are the same names you will see in the STREAMLINE™ menu. If the name appears in all capital letters, it means that it has been selected. Names appearing in straight brackets—[Name]—are names of dedicated pushbuttons.*

When an entire line from the STREAMLINE™ display is shown in these instructions and one name is bolded, select that name to move down through the Communications Parameters menus.

Selecting and Programming a Port

When the programs are loaded, the control panel will light. The top (status) line of the STREAMLINE™ display will read: DPM-700 System Diagnostics.

The bottom line will show the possible selections; each name in the bottom line labels the pushbutton immediately below it.

Panel **Comm** Trans Reboot

NOTE: *If {Comm} and {Trans} do not appear, the DPM-700 has not booted properly; turn the power OFF/ON until the complete status line appears.*

To move through the menus:
- Press one of the pushbuttons to make a selection or move down to a lower menu level.
- Press [HOME/EXIT] to move up one menu level.
- Hold down [HOME/EXIT] for 1/2 second to return to the top level menu.

To set communications parameters, select {Comm}. A new menu will appear as follows:

GPIs TenXL DP Ram Uarts **Setup**

Select {Setup}. A new menu will appear as follows:

EEPROM **USetup** Vrsn

Select {USetup}; this stands for "Uart Setup." A new menu will appear which allows you to select a port so you can verify or change its parameters. You can select:

Editor Perif Acc Slv/M

These names match the port names on the back of the DPM-700 frame.

- {Editor} selects the EDITOR port for programming. Typically it will be set for ESbus protocol.
- {Perif} selects the PERIPHERAL port for programming. Typically it will be set for Standard 100/200/300 protocol.
- {Acc} selects the ACCESSORY port for programming.
- {Slv/M} selects the SLAVE/MODEL 100/110 port for programming.

Select the name of the port you want to program. A new menu will appear which will contain some or all of the following selections:

Type Addrs Baud Uart Slvpt

Select the parameter you want to program.

Port Parameters

Type

{Type} allows you to select a protocol type for the port from the following list:

jcl kscope mod100 slave gvgpf sony

- {JCL} sets the port to use the control panel language and protocol published in the DPM-700 Digital Picture Manipulator Protocol Manual.
- {kscope} will select ESbus, which is the Grass Valley Group Kaleidoscope serial interface.
- {mod100} will select Standard 100/200/300 protocol for the port.
- {slave} is used if the port is driving a Grass Valley Group Model 100 or Model 200 switcher. Slave mode is described earlier in this manual.
- {gvgpf} selects the Grass Valley Group Peripheral II protocol. This protocol is described earlier in this manual.
- {sony} will program the port to emulate a Sony-type VTR, such as the BVH-2000, BVW-10, etc.

NOTE: *Selecting a protocol type automatically adjusts all of the other port parameters—address, baud rate, message bits, stop bits, parity, and slave mode—to the default for that type of interface. If you want to change these parameters, press [HOME / EXIT] to return to the next higher menu level and select the parameter you want to change.*

Address

{Addrs} will appear only if the protocol used for the port requires a device address. The ESbus, Standard 100/200/300, and Peripheral protocols require addresses. For ESbus protocol, the DPM-700's default address is 80 80; for 100/200/300 protocol, the default address is 30; for Peripheral protocol, the default address is 0001. The current setting is shown in the upper left-hand corner of the display.

To change the address for ESbus or 100/200/300 protocol, press the lighted soft pushbuttons to scroll through the possible values.
{THS} changes the thousands-place digit
{HRDS} changes the hundreds-place digit
{TENS} changes the tens-place digit
{UNITS} changes the unit-place digit
To change the address for peripheral protocol, press the lighted soft pushbutton beneath {INC} to increase the number or {DEC} to decrease the number.

Baud Rate

Selecting {Baud} allows you to select a baud rate: 38400, 19200, 9600, or 1200. Press the pushbutton under the selection you want. The current setting is shown in the upper left-hand corner of the display.

Uart Parameters

{Uart} allows you to set the basic UART parameters for the port:

- {Msgbit} stands for message bits; you can select either 7 or 8 by pressing the pushbutton until the value you want appears in the display.
- {Stpbit} stands for stop bits; you can select either 1 or 2 by pressing the pushbutton until the value you want appears in the display.
- Parity can be {odd},{even}, or {none}. Press the pushbutton under the selection you want. The name will appear in all capital letters to show that it is selected.

Slave Mode

Slave mode is a special mode of operation described in detail earlier in this section. It allows you to slave two ports together so that messages can pass through the DPM-700 from one port to the other, and then to a Model 100, Model 110, or Model 200 switcher.

{Slvpt} will appear in the menu as a selection only if the port you are programming has {mod100}, {100SLV}, or {200SLV} set as its type.

The ACCESSORY and SLAVE/MODEL 100/110 ports are the only ports which can be set up to be connected to the switcher. Any serial port can be configured to connect to an editor, or other controlling device. This port will relay communications from the controlling device to the switcher through the assigned ACCESSORY or SLAVE/MODEL100/110 port.

Factory Default Slave Mode: With the factory default setup, the ACCESSORY port is defined as {MOD100} under {Type}. This allows it to be connected to a controlling device that is set to talk to a Model 100 or Model 200 switcher. The SLAVE/MODEL100/110 port is defined as {100SLV} under {Type} so that it can be connected to a Model 100 switcher.

To change the factory default to a Model 200 slave configuration, perform the following keystrokes from the main menu: {Comm}; {Setup}; {USetup}; {Slv/M}; {Type}; {100SLV}. When {100SLV} is pressed it will toggle to {200SLV}. Next press [HOME/EXIT] and {SAVE}, followed by {Yes}. If {SAVE} is not selected and confirmed, the new setup will not be saved.

Programming for slave mode: Follow this procedure to slave ports together in other combinations than the factory default described earlier or if the defaults have been changed. This requires two steps for each of the two ports you plan to use: first select the correct type for the port and then select the second port as a slave. The procedure is described in detail in the following steps:

- Programming the port connected to the controlling device:
    1. Select the port you want to program, and under {Type} select {mod100} as its type.
    2. Press [HOME/EXIT] to move up one menu level. Press {Slvpt}, then assign the ACCESSORY port, selecting {Acc}, or assign the SLAVE/M100/110 port as the slave with {Slv/M}. The selection will appear in all capital letters when it is selected.

- Programming the port connected to the switcher:
    1. Press [HOME/EXIT] twice to get back to the port selection menu. Select the port that you assigned as the slave in the previous step; either {Acc} or {Slv/M}.
    2. Press [HOME/EXIT] to move up one menu level. Press {Slvpt}, then assign the port connected to the editor or controlling device as a slave to this port. Be sure to save your settings using the procedure described under "Saving Changes."

Programming the Default Setup: This is a complete list of the keystrokes needed to program the ports for the factory default setup described earlier. This sets the ACCESSORY port to talk to the editor or other controlling device and the SLAVE/MODEL100/110 port to talk to a Model 100 switcher:

- ACCESSORY port

{Comm}; {Setup}; {USetup}; {Acc}; {Type}; {mod100}; [HOME/EXIT]; {Slvpt}; {Slv/M}; [HOME/EXIT] twice. (Continue with the next sequence.)

- SLAVE/MODEL100/110 port

{Slv/M}; {Type}; {slave} (if this is already set it will read "100SLV" or "200SLV."; {100SLV}; [HOME/EXIT]; {Slvpt}; {Acc}; [HOME/EXIT]; {SAVE}; {Yes}.

Saving Changes

Changes are not saved as you make them. If you have made any changes to a parameter—type, address, baud rate, Uart parameters, or slave assignment, a {SAVE} selection will appear in the menu as follows:

```
Type    Addrs    Baud    Uart    Slvpt    SAVE
```

Press {SAVE} to save the changes. If you don't want to save the changes, press the [HOME/EXIT] pushbutton to exit the menu.

TYPICAL SYSTEM CONFIGURATIONS

The DPM-700 is designed to be versatile so that you can fit it into your system in many different ways.

The DPM-700 has seven different ports. One of these is dedicated to two-way communication with the DPM-700 control panel. The other six are available to communicate with many different external devices. You will find details and instructions to program the four serial ports under the "INTERFACES" and "SETTING COMMUNICATION PARAMETERS" headings earlier in this section. The following is a brief description of the basic functions of each port.

EDITOR Port: This port can be connected to an editing system. Depending upon the software supplied by the editor manufacturer, the editor can operate the

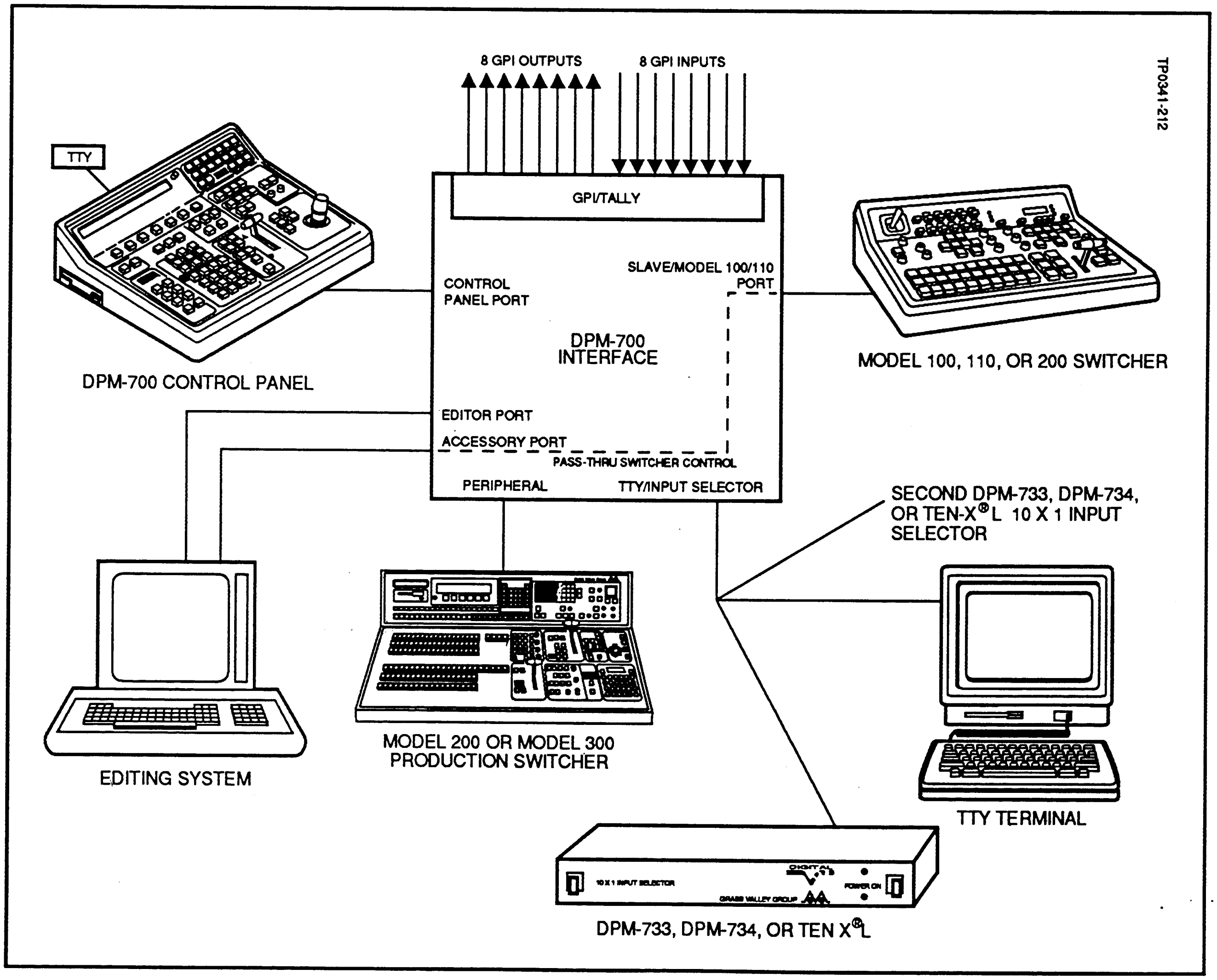

8 GPI OUTPUTS
8 GPI INPUTS
TP0341-212
TTY
GPI/TALLY
SLAVE/MODEL 100/110 PORT
CONTROL PANEL PORT
DPM-700 INTERFACE
MODEL 100, 110, OR 200 SWITCHER
DPM-700 CONTROL PANEL
EDITOR PORT
ACCESSORY PORT
PASS-THRU SWITCHER CONTROL
PERIPHERAL
TTY/INPUT SELECTOR
SECOND DPM-733, DPM-734, OR TEN-X®L 10 X 1 INPUT SELECTOR
EDITING SYSTEM
MODEL 200 OR MODEL 300 PRODUCTION SWITCHER
TTY TERMINAL
DPM-733, DPM-734, OR TEN X®L

Figure 2-31. DPM-700 Interface Capabilities

DPM-700 in several modes. The port can be programmed to emulate a GVG Kaleidoscope™ (the factory default) or a Sony VTR. Editor control can include recalls of all E-MEM® Effects Memory System registers.

TTY/INPUT SELECTOR Port: This port serves a dual function:

- It is a TTY diagnostic port. Several diagnostic functions can be performed using this versatile port when it is connected to a VT100 compatible terminal.
- The port also provides parallel, real-time control of an optional DPM-133, DPM-134, or TEN-X®L Input Selector.

The functions of the TTY/INPUT SELECTOR Port cannot be changed.

PERIPHERAL Port: This port is named for its factory default mode. Using the GVG Peripheral Protocol, the DPM-700 can communicate with a Model 200 or Model 300 Production Switcher. It will store effects in E-MEM® (Effects Memory System) registers or recall and execute E-MEM® recalls when the correct peripheral message is received.

ACCESSORY Port: This port can be configured in any of the formats available. It is most commonly used where an editor is controlling a Model 100, Model 110, or Model 200 switcher. In this pass-through mode, the DPM-700 passes on editor commands to the switcher connected to the SLAVE/MODEL 100/110 port. This is the factory-default mode for this port.

SLAVE/MODEL 100/110 Port: This port is dedicated to interface with a Grass Valley Group Model 100, Model 110, or Model 200 Switcher in the slave mode. In the factory default mode, this port is set to communicate with a Model 100 or 110 and it can be linked to the ACCESSORY Port. The ACCESSORY Port receives instructions from an editor and relays them to the switcher through the SLAVE/MODEL 100/110 Port. This mode allows a DPM-700 and an editor to communicate with a switcher on the same cable.

GPI/TALLY Ports: The DPM-700 has eight General Purpose Interface (GPI) inputs and eight GPI outputs, described under "INTERFACES" earlier in this section. These provide a simple way for the DPM-700 to control or to be controlled by an external device.

The eight GPI inputs allow you to control various DPM-700 functions with a remote device. The functions that you can assign are:

- E-MEM® recalls
- Fade-To-Black
- Cut-To-Black
- Run Effect
- Freeze Frame
- Rewind Effect
- Reverse Effect
- Next Keyframe
- Previous Keyframe
- Advance One Frame/Field
- Reverse One Frame/Field
- Fade Key
- Cut Key
- Fade Combiner
- Cut Combiner
- Input Tally

The functions can be assigned to any GPI input using the STREAMLINE® Display menu under the "Periph" selection. The inputs are triggered by a momentary connection to the common input.

Each GPI output provides a momentary contact closure to the common output when it is activated. Each output is activated by a specific DPM-700 function such as Run, Fade-To-Black, Input Tally, or a keyframeable trigger. For example, a DPM-700 GPI output could be used to start a videotape recorder from the DPM-700 control panel.

The GPI outputs can be connected to external devices, such as character generators, cart machines, and videotape recorders.

KeyLayer™ Mode with a Production Switcher

The KeyLayer™ mode and configuration allows you to switch the position of your DPM-700 from upstream to downstream of a production switcher instantly, without changing any cables (see Figure 2-32). The flexibility of the DPM-700 timing system and a pass-through mode of the keyer allow this unique application.

This configuration works equally well with either a single-channel or dual-channel application. In its simplest form, two video sources chosen for transformation are cabled to the A and B inputs of Channel 1 and to two primary inputs of a production switcher (see Figure 2-32). These sources must be in time with each other, and they must have some fixed timing relationship with the reference video of both the DPM-700 and the production switcher used. The program output of the switcher is connected to the BACKGROUND and REF inputs of the DPM-700.

You can create a more complex and powerful configuration by using two more video sources applied to the optional Second Channel.

Benefits:

- The video sources can be flown, and the resulting transformations can be keyed over the output of the production switcher or over the DPM-700 internally-generated matte.
- The preview channel of the production switcher can be transformed and entered into the final image for more complex effects.
- The DPM-700 may be positioned either upstream or downstream of the switcher without routing or re-cabling.

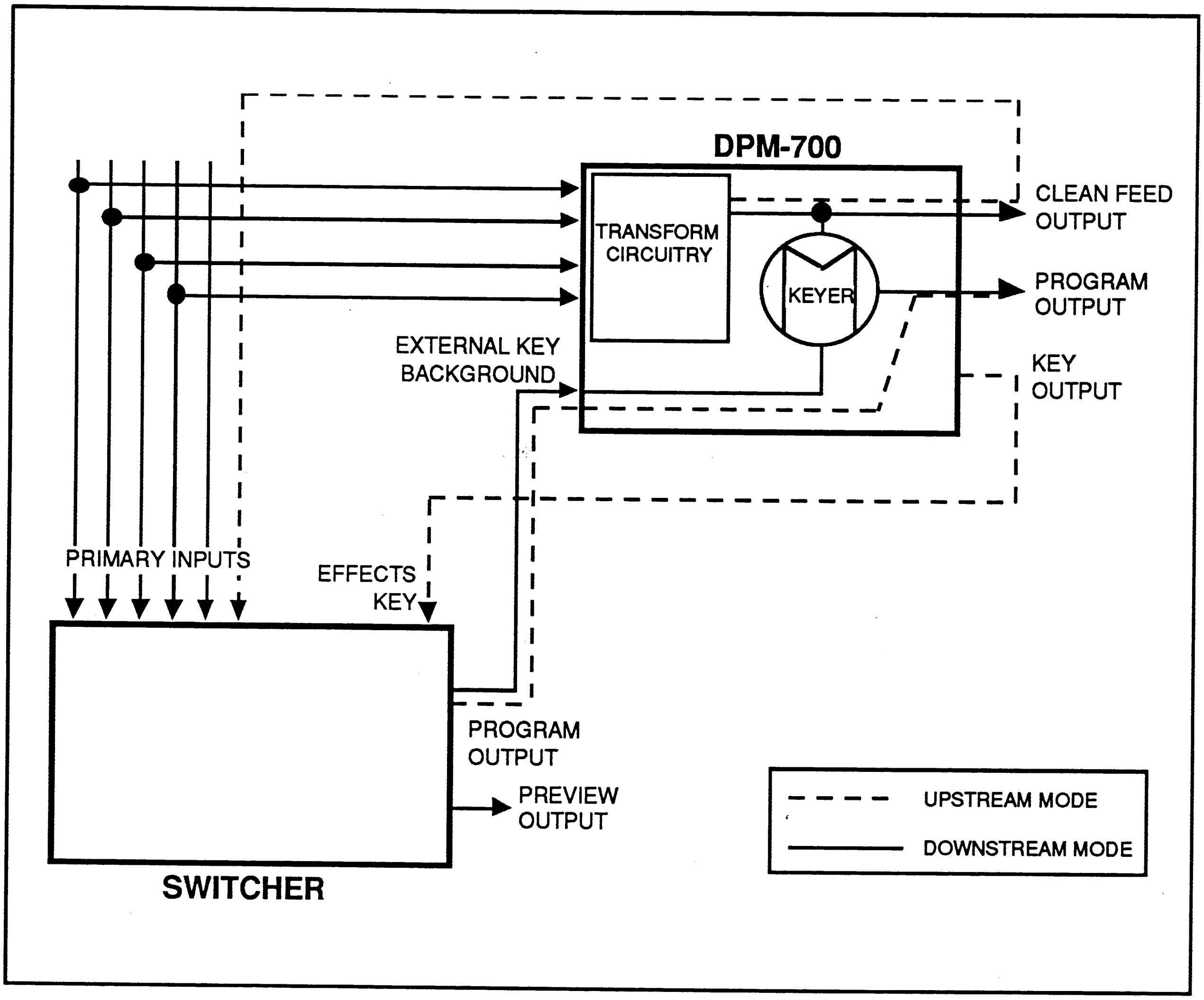

DPM-700
TRANSFORM CIRCUITRY
KEYER
CLEAN FEED OUTPUT
PROGRAM OUTPUT
KEY OUTPUT
EXTERNAL KEY BACKGROUND
PRIMARY INPUTS
EFFECTS KEY
PROGRAM OUTPUT
PREVIEW OUTPUT
SWITCHER
– – – – UPSTREAM MODE
——— DOWNSTREAM MODE

Figure 2-32. The DPM-700 with a Production Switcher: KeyLayer™ Mode

KeyLink™ Configuration

Your DPM-700 will work effectively with any switcher. When you use it with a GVG Model 110 Switcher, however, you get a very special bonus: automatic setup for the KeyLink™ mode.

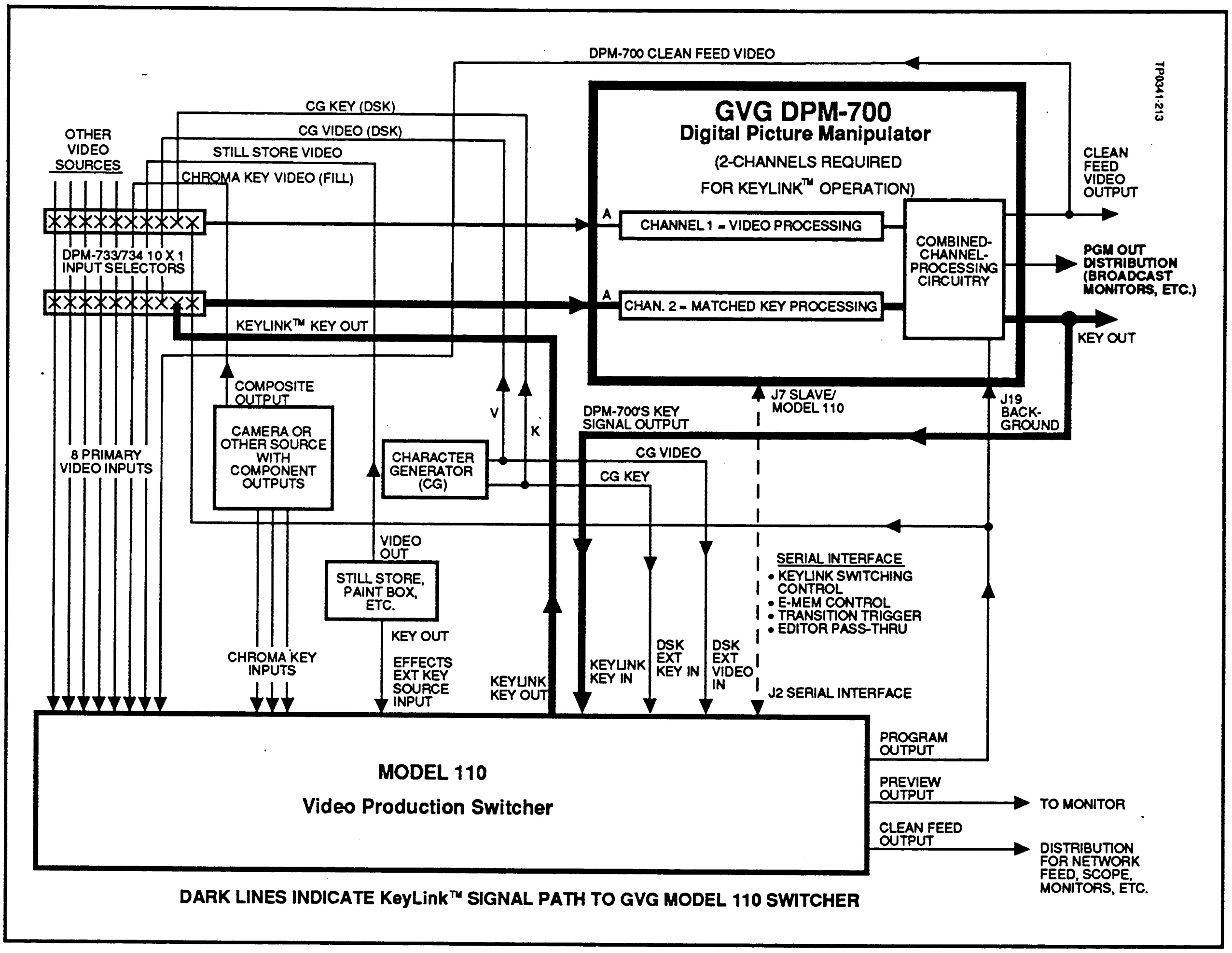
The Model 110's KeyLink™ feature allows an external key or chroma key from the Model 110 to be sent out to a digital picture manipulator for transformation. The transformed video is then returned to the Model 110, where it can be keyed in over the Program background and have a downstream key added by the switcher.

Figure 2-33 illustrates the KeyLink™ feature with the DPM-700 in concert with a GVG Model 110 production switcher. The KEYLINK™ KEY OUT signal (shown thickest) is the output of the switcher's Effects Processor. With KeyLink activated, the Effects Processor will only accept a key signal from the optional Chroma Key Input circuit or from the EFFECTS EXT KEY SOURCE INPUT.

The Model 110's KEYLINK KEY OUT signal is applied to the input selectors of the DPM-700 where you can select the signal on one of the DPM-700's channels (shown on Input A of Channel 2); also select the matching video source on the other channel (Input A of Channel 1 shown)—being the still store in this example.

The DPM-700 simultaneously and identically manipulates the key signal and matching video signal and outputs the manipulated, matching video via its CLEAN FEED OUTPUT, which is fed back to the switcher as one of its eight primary inputs. The manipulated key signal exits on the DPM-700's KEY OUT, and is returned to the switcher's KEYLINK KEY INPUT where it is routed to the Program and Preview Effects Multiplier. Here the manipulated key signal and the manipulated, matching video (selected on the Key Bus) can perform an effects key, resulting in a "flying" effects key or chroma key.

Activation of the KeyLink™ mode in the Model 110 from the DPM-700 can be done with a serial interface, if the Model 110 is equipped with the Serial Interface Option.


DPM-700 CLEAN FEED VIDEO
TP0341-213
GVG DPM-700
Digital Picture Manipulator
(2-CHANNELS REQUIRED
FOR KEYLINK™ OPERATION)
CG KEY (DSK)
CG VIDEO (DSK)
STILL STORE VIDEO
CHROMA KEY VIDEO (FILL)
OTHER VIDEO SOURCES
DPM-733/734 10 X 1 INPUT SELECTORS
A
CHANNEL 1 - VIDEO PROCESSING
A
CHAN. 2 - MATCHED KEY PROCESSING
COMBINED-CHANNEL-PROCESSING CIRCUITRY
CLEAN FEED VIDEO OUTPUT
PGM OUT DISTRIBUTION (BROADCAST MONITORS, ETC.)
KEY OUT
KEYLINK™ KEY OUT
COMPOSITE OUTPUT
CAMERA OR OTHER SOURCE WITH COMPONENT OUTPUTS
V
K
CHARACTER GENERATOR (CG)
DPM-700'S KEY SIGNAL OUTPUT
J7 SLAVE/ MODEL 110
J19 BACK-GROUND
8 PRIMARY VIDEO INPUTS
CG VIDEO
CG KEY
VIDEO OUT
STILL STORE, PAINT BOX, ETC.
KEY OUT
SERIAL INTERFACE
• KEYLINK SWITCHING CONTROL
• E-MEM CONTROL
• TRANSITION TRIGGER
• EDITOR PASS-THRU
CHROMA KEY INPUTS
EFFECTS EXT KEY SOURCE INPUT
KEYLINK KEY OUT
KEYLINK KEY IN
DSK EXT KEY IN
DSK EXT VIDEO IN
J2 SERIAL INTERFACE
MODEL 110
Video Production Switcher
PROGRAM OUTPUT
PREVIEW OUTPUT
TO MONITOR
CLEAN FEED OUTPUT
DISTRIBUTION FOR NETWORK FEED, SCOPE, MONITORS, ETC.

DARK LINES INDICATE KeyLink™ SIGNAL PATH TO GVG MODEL 110 SWITCHER

Figure 2-33. KEYLINK™ Configuration With a Model 110

Total System Configuration

Figure 2-34 shows the interconnections of a fully expanded production system with a possible combination of video production equipment. This system is designed to take advantage of the partnership between the DPM-700 and the Model 110 Switcher. They are cabled in the Upstream/Downstream mode so that the DPM-700 can operate upstream or downstream from the switcher using the STREAMLINE™ EFFECTS CONTROLLER on the DPM-700 control panel.

A variety of video sources can be distributed to the DPM-700 and the Model 110 using 10x1 input selectors; a variety of input selectors are available from Grass Valley Group. The video signals are routed to the A and B inputs of Channel 1 and Channel 2 of the DPM-700 and to the Model 110 primary inputs.

Key signals are routed to the DSK EXT KEY SOURCE INPUT and the EFFECTS EXT KEY SOURCE INPUT of the Model 110. If you have a component video source, there are CHROMA KEY INPUTS on the Model 110 (not shown) to be used for a chroma key. The key signal derived from the EFFECTS EXT KEY SOURCE INPUT or the CHROMA KEY INPUTS can be sent to the DPM-700 for manipulation and then returned to the Model 110 for use as an effects key, using the KeyLink™ feature described earlier in this section. Activation of the KeyLink mode in the Model 110 from the DPM-700 can be done with a serial interface, if the Model 110 is equipped with the Serial Interface Option.

The fill video for the Downstream Keyer in the Model 110 is routed to its DSK EXT VIDEO FILL INPUT from the primary video sources and the CLEAN FEED OUTPUT of the DPM-700.

The Model 110's PROGRAM OUT is fed to the DPM-700's final keyer via J19 BACKGROUND IN, where it can be used in a variety of ways. For both upstream and downstream modes, the final output distribution of the integrated system is taken from the DPM-700's PROGRAM OUTPUT. Details of the Upstream/Downstream mode are explained earlier in this section and in the Advanced Effects Section of the Operator Handbook.

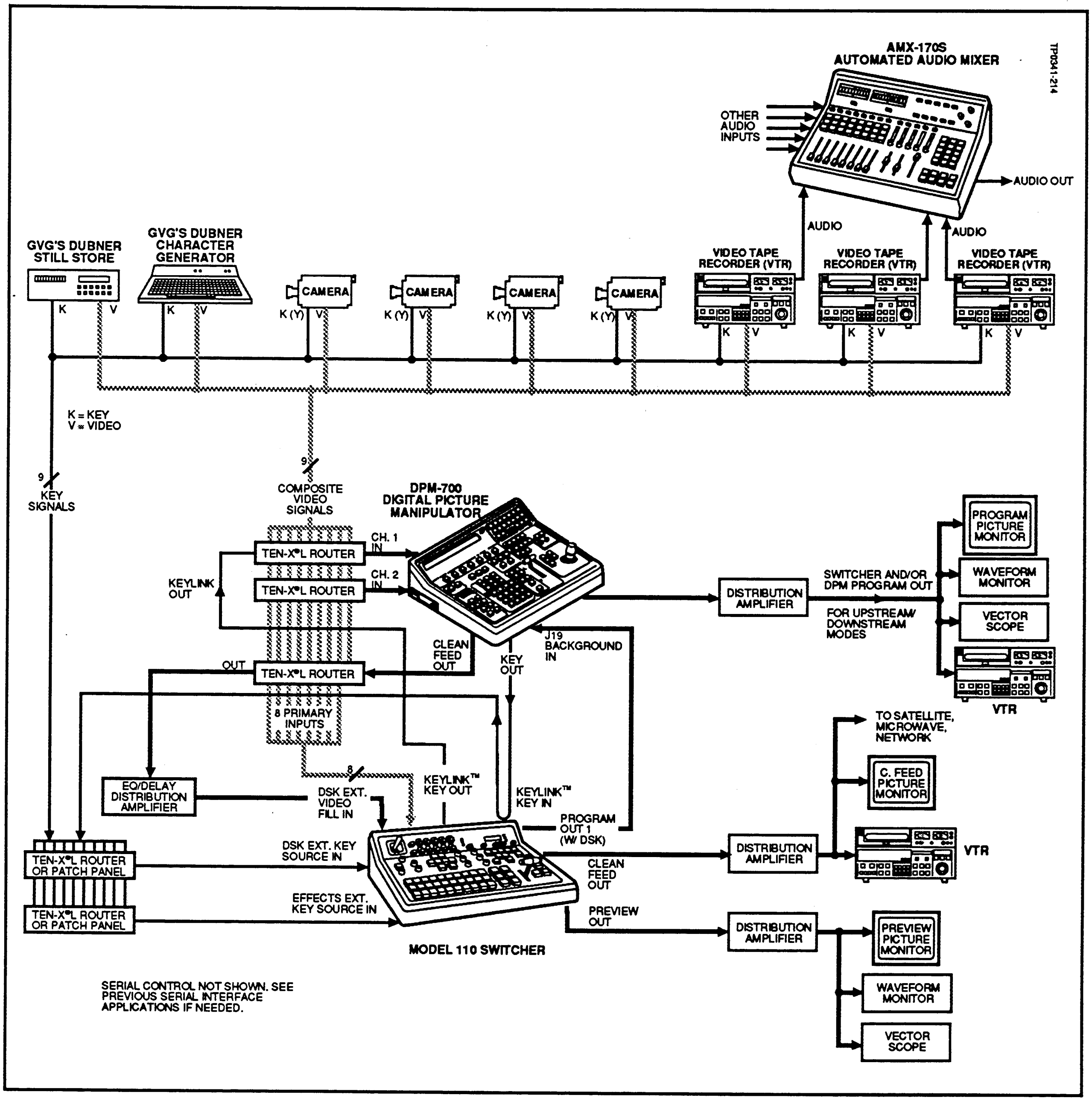

TP0341-214
AMX-170S
AUTOMATED AUDIO MIXER
OTHER AUDIO INPUTS
AUDIO OUT
AUDIO
AUDIO
VIDEO TAPE RECORDER (VTR)
VIDEO TAPE RECORDER (VTR)
VIDEO TAPE RECORDER (VTR)
GVG'S DUBNER STILL STORE
GVG'S DUBNER CHARACTER GENERATOR
CAMERA
CAMERA
CAMERA
CAMERA
K
V
K (Y)
K = KEY
V = VIDEO
9
KEY SIGNALS
9
COMPOSITE VIDEO SIGNALS
DPM-700
DIGITAL PICTURE MANIPULATOR
TEN-X®L ROUTER
CH. 1 IN
CH. 2 IN
KEYLINK OUT
CLEAN FEED OUT
KEY OUT
J19 BACKGROUND IN
OUT
8 PRIMARY INPUTS
DISTRIBUTION AMPLIFIER
SWITCHER AND/OR DPM PROGRAM OUT
FOR UPSTREAM/ DOWNSTREAM MODES
PROGRAM PICTURE MONITOR
WAVEFORM MONITOR
VECTOR SCOPE
VTR
TO SATELLITE, MICROWAVE, NETWORK
C. FEED PICTURE MONITOR
VTR
EQ/DELAY DISTRIBUTION AMPLIFIER
8
DSK EXT. VIDEO FILL IN
KEYLINK™ KEY OUT
KEYLINK™ KEY IN
PROGRAM OUT 1 (W/ DSK)
TEN-X®L ROUTER OR PATCH PANEL
TEN-X®L ROUTER OR PATCH PANEL
DSK EXT. KEY SOURCE IN
EFFECTS EXT. KEY SOURCE IN
CLEAN FEED OUT
PREVIEW OUT
DISTRIBUTION AMPLIFIER
DISTRIBUTION AMPLIFIER
PREVIEW PICTURE MONITOR
WAVEFORM MONITOR
VECTOR SCOPE
MODEL 110 SWITCHER
SERIAL CONTROL NOT SHOWN. SEE PREVIOUS SERIAL INTERFACE APPLICATIONS IF NEEDED.

Figure 2-34. Total System Configuration

DPM-700/Model 200 Configuration

When you combine your DPM-700 with a Model 200 production switcher, you will find that the addition of digital manipulation to the system creates some interesting possibilities. The versatility of the combination allows you to perform all the standard switcher functions while "flying" manipulated and keyed video over the picture.

You can use the GVG TEN-X®L or DPM series input selectors to distribute signals to the DPM-700 that are connected to the switcher and to feed back signals from one unit to the other. If your Model 200 has the Auxiliary Bus Option and current software installed, you can use the Aux Bus as an input selector for the DPM-700. The bus will function as a 26x1 input selector. Your DPM-700 will have access to all of the Model 200's primary inputs plus the two Mix/Effects outputs, the Clean Feed output, the Program output, and two direct external inputs. The two direct inputs are typically used for monitoring signals and may not be in sync. The DPM-700 can adjust the horizontal timing of all inputs on the input selector or Aux Bus, but not the vertical sync.

With the optional second channel in the DPM-700, you can select a key signal from a Model 200 M/E 1 or M/E 2 KEY OUTPUT on Channel 2 and the matching video for that key signal on Channel 1. You then can manipulate them simultaneously and indentically in the DPM-700. The manipulated video signal at the CLEAN FEED OUTPUT is routed to a Model 200 primary input, and the manipulated key signal at the KEY OUTPUT is routed to the Model 200's EXT KEY SOURCE INPUT. Using the manipulated video and key signal, the switcher can perform an effects key, resulting in a "flying" effects key or chroma key.

Communication/Control

Communication between the DPM-700 and the Model 200 can be set up in either of two ways: the Model 200 controlling the DPM-700, or the DPM-700 controlling the Model 200.

The Model 200 (with the optional Dual Serial Adapter) can control the DPM-700 on the GVG Peripheral Interface Bus.

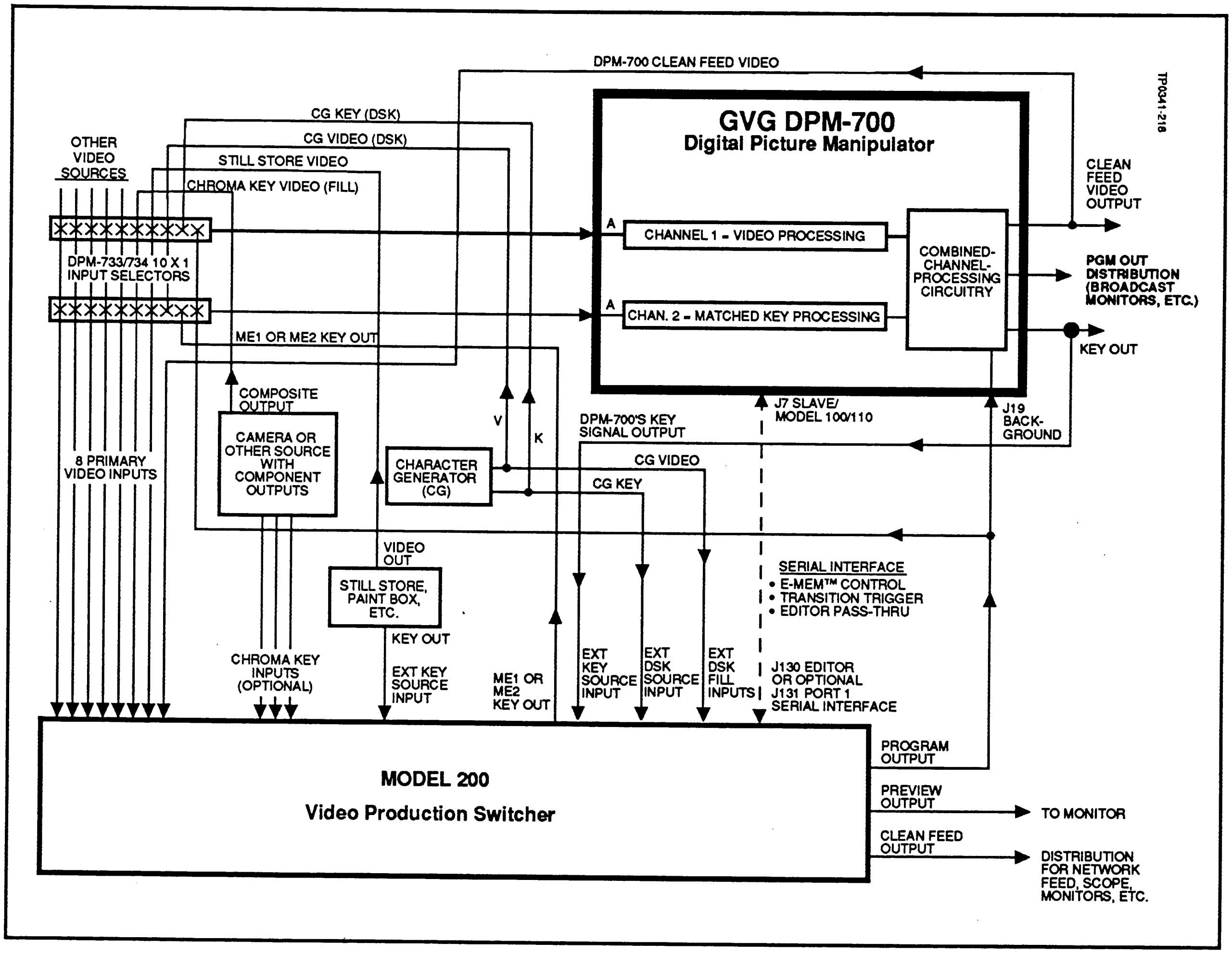

DPM-700 CLEAN FEED VIDEO
TP0341-218
CG KEY (DSK)
CG VIDEO (DSK)
OTHER VIDEO SOURCES
STILL STORE VIDEO
CHROMA KEY VIDEO (FILL)
GVG DPM-700
Digital Picture Manipulator
CLEAN FEED VIDEO OUTPUT
A
CHANNEL 1 - VIDEO PROCESSING
COMBINED-CHANNEL-PROCESSING CIRCUITRY
PGM OUT DISTRIBUTION (BROADCAST MONITORS, ETC.)
DPM-733/734 10 X 1 INPUT SELECTORS
A
CHAN. 2 - MATCHED KEY PROCESSING
KEY OUT
ME1 OR ME2 KEY OUT
COMPOSITE OUTPUT
V
K
J7 SLAVE/ MODEL 100/110
J19 BACK-GROUND
CAMERA OR OTHER SOURCE WITH COMPONENT OUTPUTS
DPM-700'S KEY SIGNAL OUTPUT
8 PRIMARY VIDEO INPUTS
CHARACTER GENERATOR (CG)
CG VIDEO
CG KEY
VIDEO OUT
STILL STORE, PAINT BOX, ETC.
SERIAL INTERFACE
• E-MEM™ CONTROL
• TRANSITION TRIGGER
• EDITOR PASS-THRU
KEY OUT
CHROMA KEY INPUTS (OPTIONAL)
EXT KEY SOURCE INPUT
ME1 OR ME2 KEY OUT
EXT KEY SOURCE INPUT
EXT DSK SOURCE INPUT
EXT DSK FILL INPUTS
J130 EDITOR OR OPTIONAL J131 PORT 1 SERIAL INTERFACE
MODEL 200
Video Production Switcher
PROGRAM OUTPUT
PREVIEW OUTPUT
TO MONITOR
CLEAN FEED OUTPUT
DISTRIBUTION FOR NETWORK FEED, SCOPE, MONITORS, ETC.

Figure 2-35. DPM-700/Model 200 Configuration

The DPM-700 can control the Model 200 in a slave mode using GVG's switcher protocol. An editor can be added to this configuration in a "pass-through" mode. In this mode the DPM-700 and the editor control the Model 200 through the switcher's EDITOR port. The details of these control modes are explained below.

The Model 200 Controlling the DPM-700

You can perform learns and recalls of the DPM-700 E-MEM® from the Model 200 over the Peripheral Interface Bus. There are Model 200 options necessary and certain conditions that must be set up on both systems for correct operation.

Model 200 Options Required:

- Model 200 Dual Serial Adapter Option
- Model 200 STREAMLINE™ EFFECTS CONTROLLER Option

Connection of the Peripheral Interface: A special serial cable is required for communication between the DPM-700 PERIPHERAL port and PORT 1 on the Model 200 frame. This cable can be ordered from Grass Valley Group, or you can build your own cable using standard female 9-pin D connectors.

To build your own cable, connect all pins on a one-to-one basis, except for the receive and transmit pins. The receive and transmit wires must be swapped so that Rx- and Rx+ of one connector are wired to Tx- and Tx+, respectively, of the other connector. For more information, refer to the figure titled "DPM-700 to Switcher-Cable Pin-out" earlier in this section.

Setting Up the Peripheral Interface: Certain conditions must be set on both systems for proper operation:

- The serial port used on the DPM-700 must be programmed for the Peripheral Interface (see "SETTING COMMUNICATION PARAMETERS" earlier in this section). Connector J5, the PERIPHERAL port on the back of the DPM-700 electronics frame, is set for Peripheral protocol at the factory.

- The baud rate, parity, and communication standard must be the same for the DPM-700 port used and for PORT 1 of the Model 200 serial interface.

  On the DPM-700, the default baud rate is 38400; the default parity is ODD. All of the serial ports are fixed as RS422, except for the EDITOR port, which can be configured for both RS232 and RS422.

  The Model 200 peripheral communication parameters are set up using the diagnostic pod under Setup Function 5, PERIPH COMM.

Enabling The Peripheral Interface and Triggers:

- The peripheral interface must be enabled and the peripheral address must be set at both the DPM-700 and the Model 200.

  At the DPM-700, both of these functions are set with the STREAMLINE™ display. To enable the DPM-700 serial ports, use the {Periph} menu. Select {Enabls} and then {editor}. A capitalized "EDITOR" indicates that the serial ports are enabled. To set the peripheral address, see "SETTING COMMUNICATION PARAMETERS" earlier in this section. The factory default address is 01.

  The Model 200 Peripheral Interface is enabled when the PERIPH pushbutton is lit at the top-center of the control panel. Press PERIPH to enable the interface. The peripheral address of the DPM-700 is set in the Model 200 with either the STREAMLINE™ display or the diagnostics pod, depending on the mode of operation. Details are given for each case later in this section.

- There are two selections in the {Enabls} menu that control how the DPM-700 uses the peripheral commands from the Model 200. They are {Pflrn} and {Pftrg}. When these selections are disabled, they are displayed in partial lowercase, as shown above. When enabled, they are displayed in all caps—{PFLRN} and {PFTRG}.

When {PFLRN} is enabled, a learn performed at the Model 200 panel (with the interface enabled) will cause the DPM-700 to learn the current effect to the selected register. When it is disabled, the DPM-700 will not perform a learn.

When {Pftrg} is disabled, a recall performed at the Model 200 will cause the DPM-700 to run the effect located in the selected register. A trigger from the Model 200 will cause the DPM-700 to run the effect located in the register that corresponds to the trigger number (0-15). When {PFTRG} is enabled, a recall from the Model 200 will cause the DPM-700 to recall the selected register to the current effect buffer, but not to run it. A trigger from the Model 200 will cause the DPM-700 to perform one of the functions shown in Table 2-6.

Table 2-6. Peripheral Trigger Functions

Trigger #	Function
0	PLAY
1	STOP
2	RUN
3	NEXT KEYFRAME
4	PREVIOUS KEYFRAME
5	STOP NEXT
6	REWIND
7	REVERSE
8	KEYER AUTO-TRANS
9	KEYER CUT
10	FADE TO BLACK AUTO-TRANS
11	FADE TO BLACK CUT
12	COMBINER AUTO-TRANS (2 Chan.)
13	COMBINER CUT (2 Channel)
14	STOP
15	STOP

DPM-700 Learns from the Model 200 Panel: When the peripheral interface is enabled at both the Model 200 and the DPM-700, as described above, and {PFLRN} is enabled, all learns at the Model 200 E-MEM® panel are performed at the DPM-700 as well. When you perform a "learn" at the Model 200 E-MEM® panel, the effect stored in the DPM-700 current effect buffer is saved in the selected DPM-700

E-MEM® register. The DPM-700 register number will correspond to the register number selected at the Model 200 panel.

Note: *If the "PERIPH" pushbutton is lit when you do a "learn" at the Model 200, and {PFLRN} is enabled, a learn is also performed at the DPM-700. Be sure to disable the peripheral interface or {Pflrn} if you don't intend to do a DPM-700 learn.*

DPM-700 Recalls Or Triggers From The Model 200 Panel: There are four ways you can activate a DPM-700 recall, run, or trigger from the Model 200:

1. Recall a Model 200 E-MEM® register that activates a run, or a recall to the current effect buffer, from the same DPM-700 register.
2. Test a peripheral GPI setup.
3. Recall a Model 200 E-MEM® register that has learned a peripheral GPI setup.
4. Recall a Model 200 E-MEM® register that has learned a timeline effect which contains a peripheral GPI setup.

You can use the first method to perform recalls or runs from registers 0 through 39. The remaining three methods rely on six programmable, peripheral GPIs (A through F). These are set using the Model 200 diagnostics pod. Triggers assigned to the peripheral GPIs activate recalls of DPM-700 E-MEM® registers 0 through 15, or activate functions (Table 2-6). The following procedures give details of these methods:

1. You can recall a Model 200 E-MEM® register that activates a recall or a run of the same DPM-700 register. The following instructions describe how this is done:

    - Enable the DPM-700 peripheral address in the {Misc} menu of the Model 200 STREAMLINE™ display. Do this by setting the device number "on." The device number corresponds to the peripheral address.

Be sure that the Periph pushbutton is not lit, or that {Pflrn} is disabled, to prevent learning to the DPM-700 E-MEM® from its current effect buffer.

- At the Model 200, perform a learn to the same register number as the DPM-700 register that contains the effect to be run. The Model 200 E-MEM® has four banks with 10 registers each. The fourth bank is reserved for timeline storage only.

To run the desired effect, first enable {PFTRG} in the DPM-700 {Periph}, {Enabls} menu. Then activate the peripheral interface with the Model 200 PERIPH pushbutton, and perform a Model 200 E-MEM® system recall of the previously learned register. This will cause the DPM-700 to run the effect from its selected register.

To just recall the desired effect to the DPM-700's current effect buffer, disable the {Pftrg} selection and follow the same process.

2. You can perform a test of a peripheral GPI setup to determine whether your peripheral interface settings and connections are correct. A peripheral GPI or serial GPI consists of serial digital data transmitted over a peripheral bus using GVG Peripheral Protocol.

A peripheral GPI can be one of six setups (A through F) with a peripheral device number (zero through 23) and a trigger (zero through 15) assigned to it. The device number and trigger are assigned using the Model 200 diagnostics pod. The device number corresponds to the DPM-700's peripheral address.

The following steps describe how to test your peripheral GPI interface:

- Define one or more of the peripheral GPIs, A through F, using the Model 200 diagnostics pod. Select Setup Function 6, PERIPH GPI, and designate a peripheral device number, 0 through 23, and a trigger, zero through 15, for each GPI. With {Pftrg} disabled, the

DPM-700 responds to the trigger by running one of its E-MEM registers, 0-15.
With {PFTRG} enabled, the DPM-700 responds to the trigger with one of the actions shown in Table 2-6.

- Check that the PERIPH pushbutton in the top center of the Model 200 control panel is lit. The GPI test function is located in the Model 200 STREAMLINE™ menu under the {Misc} selection. As you select and test each GPI, the display will indicate that the trigger is transmitted, and the DPM-700 will either run the effect from its corresponding register ({Pftrg} disabled), or it will perform a trigger function according to Table 2-6 ({PFTRG} enabled).

3. You can recall a Model 200 E-MEM® register that has learned a peripheral GPI setup (described above).

   With {Pftrg} disabled, when a Model 200 register that has learned a peripheral GPI is recalled, the DPM-700 interprets the trigger numbers to correspond to DPM-700 E-MEM® registers zero through 15. This causes the DPM-700 to run a stored effect from the register designated by the trigger.

   With {PFTRG} enabled, the same Model 200 recall will cause the DPM-700 to perform the action that corresponds to the trigger number, as shown in Table 2-6.

   The following procedure describes how to perform this type of recall:

   - Define the peripheral GPI using the Model 200 diagnostics pod, as described in paragraph 2, above.
   - With PERIPH off or {Pflrn} disabled, and the RECALL pushbuttons off, select an E-MEM® bank and register. Use the Model 200 STREAMLINE™ display menu under the {Atrib} selection to assign a peripheral GPI (A through F) to "gpi1" or "gpi2".

- Learn this setup to the E-MEM register selected above.

- To run the desired effect, activate the peripheral interface with the PERIPH pushbutton, and perform a Model 200 E-MEM® recall of the previously learned register. This will cause the DPM-700 to run the effect stored in the register designated by the GPI trigger ({Pftrg} disabled), or it will perform a trigger function according to Table 2-6 ({PFTRG} enabled).

4. You can recall a Model 200 E-MEM® register that has learned a timeline effect with a peripheral GPI setup. This allows the combination of several panel setups and digital effects over a period of up to 10 minutes for each E-MEM register. E-MEM bank four is dedicated to learning timelines.

   - Define the peripheral GPI using the Model 200 diagnostics pod, as described in paragraph 2, above.

   - Program the timeline using the Model 200 STREAMLINE™ display menus. Refer to the Model 200 Operator's Handbook for programming details. You can select any of the six peripheral GPIs (A through F) as timeline events.

   - With the PERIPH pushbutton off, learn the timeline into one of the Model 200 E-MEM® registers in bank four.

   - After enabling the peripheral interface with the PERIPH pushbutton on the Model 200 control panel, you can run the learned timeline by recalling the appropriate E-MEM® register from bank four. The DPM-700 will run the effects located in its E-MEM® registers, 0 through 15 ({Pftrg} disabled), or it will perform trigger functions according to Table 2-6 ({PFTRG} enabled), corresponding to the trigger(s) programmed into the GPI(s) in the timeline.

The DPM-700 Controlling the Model 200

The DPM-700 and the Model 200 will operate in a slave mode. This allows the DPM-700 to control the following functions of the Model 200:

- Select up to two Model 200 Aux Bus outputs to function as input selectors for the DPM-700.
- Recall Model 200 E-MEM® registers and trigger auto-transitions, fade-to-black, or downstream key transitions, all key-frameable.
- Save Model 200 E-MEM® registers to the DPM-700 floppy disk drive.

Selection of the Aux Bus requires the following Model 200 Options:

- Aux Bus Output Module
- Local or Satellite Aux Bus Control Panel
- Dual Serial Adapter Option

You can still operate in the slave mode with only the Dual Serial Adapter Option, but you will have no Aux Bus capability.

Software Requirements: You will need version 2.0 or later of the DPM-700 System Software and any version of Model 200 software to operate in the slave mode.

In order to operate a Model 200 Aux Bus as a DPM-700 input selector you need DPM-700 System Software version 2.0, or later. You also need a version of Model 200 software later than those listed here with their respective models:

Model 200-1	077572-02
Model 200-2	077521-04
Model 200-2CV	077815-02

Connecting for Slave Mode: A special serial cable is required for communication between the DPM-700 SLAVE/MODEL 100/110 port and the EDITOR port on the Model 200 frame. This cable can be ordered from Grass Valley Group (part number 054714), or you can build your own cable using standard female 9-pin D connectors.

To build your own cable, connect all pins on a one-to-one basis, except for the receive and transmit pins. The receive and transmit wires must be swapped so that Rx- and Rx+ of one connector are wired to Tx- and Tx+, respectively, of the other connector. For more information, refer to the figure titled "DPM-700 to Switcher-Cable Pin-out" earlier in this section.

Setting Up the Serial Interface: Certain conditions must be set on both systems for proper operation:

- The baud rate, parity, and communication standard must be the same for the DPM-700 port used and for PORT 1 of the Model 200 serial interface.

  On the DPM-700, the default baud rate is 38400; the default parity is ODD. All of the serial ports are fixed as RS422, except for the EDITOR port, which can be configured for both RS232 and RS422.

  The Model 200 Editor communication parameters are set up using the diagnostic pod under Setup Function 4, EDITOR COMM.

- The interface must be enabled at both the DPM-700 and the Model 200.

  To enable the DPM-700 serial ports, use the STREAMLINE™ display {Periph} menu. Select {Enabls} and then {editor}. A capitalized "EDITOR" indicates that the serial ports are enabled.

  The Model 200 Editor Interface is enabled when the EDITOR pushbutton is lit at the top-center of the control panel. Press EDITOR to enable the interface.

Programming the DPM-700 Port: The factory default for the SLAVE/MODEL 100/110 port is set to interface with a Model 100/110 switcher. To set the port for the Model 200 interface, refer to "SETTING COMMUNICATION PARAMETERS" earlier in this section.

Programming the Model 200 Aux Bus: Of the four Aux Bus outputs available with the Model 200 option, any two can be designated as input selectors for the DPM-700. You must assign an Aux Bus output to the DPM-700 with the Model 200 diagnostics pod. Use Personality Function 21 to make the assignment.

Aux Bus Assignment at the DPM-700: Each channel in the DPM-700 may be assigned to an Aux Bus. You assign an Aux Bus to a channel using the {Eng} menu of the STREAMLINE™ display. You will not be able to select an Aux Bus unless a serial port has been programmed for the Model 200 slave mode, as described earlier.

Timing the Aux Bus Inputs: The DPM-700 has versatile input and output timing capability. The Aux Bus can be timed in the same way you would time a 10x1 input selector. Refer to the timing procedures discussed previously in this section to time the Aux Bus inputs.

Crosspoint selection on the Aux Bus: All input selections are made from the Model 200 Aux Bus control panel. The NEAR and FAR pushbuttons on the DPM-700 control panel determine whether the input video selected at the Aux Bus control panel is assigned to the **near** side (nearest to the observer) or the **far** side of the "object" being manipulated in the DPM-700. The Aux Bus tally lights indicate which video inputs are being routed to the DPM-700.

For details on operation of the Model 200 Aux Bus with the DPM-700, refer to the DPM-700 Operator's Handbook and the Model 200 Operator's Handbook.

Section 3
Operating Instructions

INTRODUCTION

This section of the manual is designed to give you a quick reference to all system operations. It is laid out in two parts, as follows:

Part 1 is in the form of a dictionary and lists each control on the DPM-700 panel alphabetically, including pushbuttons, knobs, displays, the lever, and the joystick. Controls which cannot be alphabetized, such as 0-9, are listed first. Names of pushbuttons are contained in square brackets: [PUSHBUTTON NAME].

In the dictionary, each listing for a control begins with a main heading in the left-hand column which gives the name of the control. The first entry in the right hand column, in parentheses, is the name of the control panel section where the control is located. Some control names are used in more than one section. In these cases, each section is given a separate listing under the main heading. Following the section name is a detailed description of how each designated control operates, including what it does, under what conditions it is active and/or appropriate, and its interaction with other controls.

Part II contains tree charts for the STREAMLINE™ menus: {Border}, {Disk}, {Eng}, {Input Selector}, {KeyLayer}, {Misc}, {Modify}, {Path}, {Periph}, {Person}, {Pict}, {Recursive}, {Sfx}, and {Term}. You will find these tree charts at the end of this section.

MAIN HEADING	**(NAME OF SECTION where control is located) Description of how control operates.**
[0]-[9]	(DIRECT ENTRY section) The keypad in the DIRECT ENTRY section can be delegated to any of the following functions: • To move to a particular key frame in an effect (select [GOTO KF], key in the key frame number, press [ENTER]; • To set duration times for key frames (go to the key frame, select [KF DUR], key in the time, press [ENTER] and then press [REPLCE]); • To set duration times for an entire current effect (select [EFF DUR], key in the time, press [ENTER]); • To enter X, Y, and Z values for transform operations (select [X], [Y], or [Z], key in the value, press [ENTER]). • To enter values for various STREAMLINE™ menu functions. (E-MEM® section) The E-MEM® Effects Memory keypad is used to select registers for learning key frame effects and for running and/or recalling them later. • To Learn an Effect: select one or more [LEARN] pushbuttons, press BANK followed by the bank number, then press the register number. • To Run an Effect: make sure [RECALL TO CUR EFF] is not lighted; press a [RECALL] pushbutton, press BANK followed by the bank number, then press the register number. • To Recall an Effect into the Current Effect Space: select [RECALL TO CUR EFF], press BANK followed by the bank number, then press the register number.
[AUTO TRANS]	(TRANSITION section) The [AUTO TRANS] pushbutton can be delegated to either the Combiner, the Output Key, the Effect, or the Fade to Black function. • If a [COMBINER] transition is selected, pressing [AUTO TRANS] will perform an automatic transition between the two channels; one channel will appear in front of the other. The transition will take place at the rate selected using the {Misc} Menu (select {Dur} and then {COMB} and use the

soft knob or Direct Entry keypad to enter the desired rate). Note that this operation is meaningful only if the optional Second Channel is installed in the system.

- If an [OUTPUT KEY] transition is selected, pressing [AUTO TRANS] will perform an automatic transition of the key to insert it into or remove it from the PROGRAM and CLEAN FEED outputs, depending on its current status. The transition will take place at the rate selected using the {Misc} Menu (select {Dur} and then {KEY} and use the soft knob or Direct Entry keypad to enter the desired rate).
- If an [EFFECT] transition is selected, pressing [AUTO TRANS] will run the effect. In normal mode ([STOP/NEXT] off), each press performs the entire current effect once, from beginning to end. When [STOP/NEXT] is selected (lighted), each press will step through one key frame of the effect. When [REV] is selected, the effect will run backwards.
- If an [FTB] transition is selected, pressing [AUTO TRANS] will perform an automatic transition into or up from black, depending on the current status of the system. The transition will take place at the rate selected using the {Misc} menu (select {Dur} and then {FTB} and use the soft knob or Direct Entry keypad to enter the desired rate).

[AXIS LOCATE]

(TRANSFORM section) Selecting [AXIS LOCATE] allows you to relocate the axes (shown by the cursors) for the delegated path(s).

[AXIS LOCK]

(TRANSFORM section) When [AXIS LOCK] is selected, the axes (shown by the cursor) for the delegated channel(s) will be locked to the picture and will be manipulated with it automatically. For example, if you move the picture, the axes will move in the same direction and by the same amount.

[BANK]

(E-MEM® section) There are ten different banks, numbered 0 through 9, in the E-MEM® Effects Memory system. Press [BANK], then the number of the bank you want. The bank number will be displayed as the left digit in the E-MEM® display.

[CH 1]

(DELEGATION section) Pressing [CH 1] delegates the control panel to Channel 1, the video channel which comes with a standard DPM-700. You can also manipulate the Channel 1 picture by selecting [GLOBAL] delegation and using the global transform parameters; these parameters apply to both the Channel 1 and (optional) Channel 2 pictures together.

(OUTPUT section) Pressing [CH 1] selects Channel 1 as an output of the DPM-700 system.

[CH 2]

(DELEGATION section) You must have the Second Channel option installed in order to use this pushbutton. Pressing [CH 2] delegates the control panel to Channel 2. You can also manipulate the Channel 2 picture by selecting [GLOBAL] delegation and using the global transform parameters; these parameters apply to both the Channel 1 and Channel 2 pictures together.

(OUTPUT section) You must have the Second Channel option installed in order to use this pushbutton. Pressing [CH 2] selects Channel 2 as an output of the DPM-700 system.

[CLEAR]

(DIRECT ENTRY section) Press CLEAR to erase data that you have keyed in but do not want to enter.

[CLEAR WORKNG KF]

(KEYFRAME/EDIT section) The working key frame is a memory buffer which holds the parameters for a single key frame picture. Whenever you use the control panel to set up or to change a key frame, these changes take place in the working key frame buffer. Also, as you move through a key frame effect which is in the current effect space, a copy of the currently selected point in the effect is automatically placed in the working key frame buffer.

- Pressing [CLEAR WORKNG KF] sets the transform parameters of the working key frame back to a set of user default values for those channels/paths selected under DELEGATION. These default values are entered as part of Personality (listed under the {Eng} menu). If the user has not entered any values, the user default values will be the same as the default values which were set at the factory.
- Holding down [CLEAR WORKNG KF] for 1/2 second sets all of the parameters of the working key frame back to their user default values for those channels/paths selected under DELEGATION except for input selection and keyer values.

Note that clearing the working key frame will not change the current effect in any way. To change the current effect, you must use the KEYFRAME EDIT pushbuttons to restore, replace, delete, or insert a key frame.

Key frames which are cleared are stored in a special memory space until you perform another [CLEAR WORKNG KF] or [DELETE] operation. This allows you to undo a [CLEAR WORKNG KF] operation by pressing the [RESTOR WORKNG KF] pushbutton. You can also use the clear/restore functions to duplicate a key frame and insert it elsewhere in the effect:

- Go to a key frame and press [CLEAR WORKNG KF] to place a duplicate of the key frame into memory.
- Move to another place in the effect and press [RESTOR WORKNG KF] to restore the cleared key frame to the working key frame buffer.
- Press [INSERT BEFORE], [INSERT AFTER], or [REPLCE] to insert the key frame into the effect in its new location.

CLIP knob

(KEYER section) The CLIP control knob sets the dc reference level which will be compared to the luminance level of the key source for luminance and linear keys. Wherever the key source level is greater than the clip reference level, a "hole" will be cut in the background so that key fill video can be inserted.

The same CLIP knob is used for both luminance and linear keys, depending on panel delegation;, but the clip values for each are stored separately. The knob is delegated to luminance key when [SELF KEY] is on and [LINEAR KEY] is off; it is delegated to linear key when [SELF KEY] is and [LINEAR KEY] are both on.

Adjusting the clip level changes the key hole shape. Turning the knob counterclockwise lowers the clip reference level and makes the hole larger. At the knob's full counterclockwise setting, the key fill signal will fill the entire screen.

[COMBINER]

(OUTPUT section) This pushbutton is not used unless the optional Second Channel is installed in the system. When [COMBINER] is selected, the system output will be a combination of Channel 1 and

Channel 2. The [AUTO TRANS] and [CUT] pushbuttons in the OUTPUT section will be active and will perform combiner transitions.

(TRANSITION section) This pushbutton is not used unless the optional Second Channel is installed in the system. Selecting [COMBINER] delegates the [AUTO TRANS] and [CUT] pushbuttons and the lever to the combiner function, as follows:

- Pressing [AUTO TRANS] will perform an automatic transition between the two channels; one channel will appear in front of the other. The transition will take place at the rate selected using the {Misc} menu (select {Dur} and then {COMB} and use the soft knob or Direct Entry keypad to enter the desired rate).
- Pressing [CUT] performs an immediate transition between the two channels.
- Moving the lever will perform a transition between the two channels.

Control knob

See CLIP knob, GAIN knob, STREAMLINE™ knob.

[CUT]

(TRANSITION section) The [CUT] pushbutton is used to perform an immediate transition between two states, as follows:

- Pressing [CUT] when the optional Second Channel is installed in the system and the [COMBINER] pushbutton is selected performs an immediate transition between the two channels.
- Pressing [CUT] when the [OUTPUT KEY] pushbutton is selected performs an immediate transition of the key, inserting the key into the background or removing it, depending on its current state.
- Pressing [CUT] when the [FTB] pushbutton is selected performs an immediate transition into or up from black, depending on the current state of the system.

[DELETE]

(KEYFRAME/EDIT section) Pressing [DELETE] removes a key frame, including its duration, from the current effect. Note that you must be actually on a key frame in order to delete it; the pushbutton is inactive when you are between key frames. To go to a key frame, press [GOTO KF], then the number of the key frame, then [ENTER].

You can undo a delete up to the point where you perform another [DELETE] or a [CLEAR WORKNG KF]. Until then, the data for the deleted key frame is stored in a special memory space. Press [RESTOR WORKNG KF] to restore the deleted data to the working key frame area. Press [INSERT AFTER], [INSERT BEFORE], or [REPLCE] to insert the working key frame into the current effect, either in the same place it was before or in a new location.

You can use the undo function to move a key frame to a different place in the effect, as follows:
- Go to a key frame and press [DELETE] to delete the key frame and place it into memory.
- Move to another place in the effect and press [RESTOR WORKNG KF] to restore the deleted key frame to the working key frame buffer.
- Press [INSERT BEFORE], I[INSERT AFTER], or [REPLCE] to insert the key frame into the effect in its new location.

[DETENT]

(DIRECT ENTRY section) The detent function is a quick way of rounding off X, Y, or Z values for transform functions. That is, it changes the value to the nearest of a group of preselected values. As an example, if X = 1.3 for a location transform, you could use the detent function to change it to X = 2, the nearest detent value. To use detent, first select a pushbutton in the TRANSFORM section, then select [X], [Y], or [Z] and press [DETENT]. The new value will be shown in the DIRECT ENTRY display.

Display

(DIRECT ENTRY section) This display shows the current values for various transform and effect parameters. Parameters are chosen for display using the STREAMLINE™, TRANSFORM, and/or [X], [Y] and [Z] pushbuttons; the current display delegation is shown in the upper right-hand corner of the STREAMLINE™ display.

(E-MEM® section) The left digit of the E-MEM® display shows the number of the bank you are currently using for learn and/or recall operations; the banks are numbered 0 through 9. The right digit shows the most-recently-selected register number; the registers are numbered 0 through 9.

	(KEYFRAME section) When you have an effect in the key frame current effect space, this display shows which key frame in the effect is currently selected. For example, if you are on Key Frame #2 or at a point between Key Frame #2 and Key Frame #3, the display will show the number "2."
	(STREAMLINE™ section) This display gives you status information and prompts for STREAMLINE™ programs. The display is used to label the "soft" pushbuttons and the "soft" knob with their current functions.
[EFF DUR]	(DIRECT ENTRY section) Select this pushbutton to change the time for the overall duration of the effect in the key frame current effect space. Note that the duration of each individual key frame in an effect will be adjusted in proportion to the overall change. To enter the effect duration, press [EFF DUR], enter the desired time, press [ENTER].
[EFFECT]	(EFFECT section) Selecting [EFFECT] delegates the lever to the key frame effect function. When [EFFECT] is selected, moving the lever will perform the effect manually. Moving the lever from one limit to the other will perform one complete effect unless [STOP/NEXT] is selected; in that case, each complete lever movement will step the effect through one key frame.
[ENTER]	(DIRECT ENTRY section) Pressing [ENTER] confirms data entry in the DIRECT ENTRY section of the panel.
[EXT KEY CH 1]	(KEYER section) When [EXT KEY CH 1] is selected, Channel 1 will be used as a dedicated key channel. This pushbutton is only used when you have the optional Second Channel installed.
[EXT KEY CH 2]	(KEYER section) When [EXT KEY CH 2] is selected, Channel 2 will be used as a dedicated key channel. This pushbutton is only used when you have the optional Second Channel installed.
[FAR]	(INPUT section) Press [FAR] and select an input; that input will be assigned to the far or back side of the DPM-700 picture on the delegated channel(s). • If you are using the standard A/B inputs or a 10x1 input router, the appropriate Input Selector menu

will appear in the display automatically when you press [FAR].
- If you are using a Model 200 Aux Bus as an input selector, use the Aux Bus control panel to select the input.

[FTB]

(TRANSITION section) Selecting [FTB] delegates the [AUTO TRANS] and [CUT] pushbuttons and the lever to the fade to black function, as follows:
- Pressing [AUTO TRANS] will perform an automatic transition into or up from black, depending on the current status of the system. The transition will take place at the rate selected using the Misc Menu (select {Dur} and then {FTB} and use the soft knob or Direct Entry keypad to enter the desired rate).
- Pressing [CUT] performs an immediate transition into or up from black, depending on the current state of the system.
- Moving the lever will fade the system into or up from black, depending on its current state. Moving the lever from one limit to the other will perform one complete fade.

The fade to black function is always active and available, even when a key frame effect is running. Fade to black states can also be stored in key frames and run automatically as part of an effect.

GAIN knob

(KEYER section) The GAIN control knob is used for both luminance and linear keys, but the gain values for each are stored separately. The knob is delegated to luminance key when [SELF KEY] is on and [LINEAR KEY] is off; it is delegated to linear key when [SELF KEY] and [LINEAR KEY] are both on.

Gain determines a key's edge sharpness—that is, the speed at which the picture changes between the background and the key fill signals. When gain = 1, the key edge will be exactly the same as the input signal. As gain increases, the change takes place more slowly and the two signals will appear more mixed (softer) at the point of transition. For a luminance key, gain can be very high or can approach linear. For a linear key, gain has a comparatively small range which includes true linearity (unity, or gain = 1). Turn the GAIN knob clockwise to increase the gain.

[GLOBAL]

(DELEGATION section) Global refers to global control, a feature which allows you to perform transforms using a set of global parameters which are different from the channel parameters. This extra set of transform parameters allows you to create complex movements and effects. For example, you could spin and orbit a picture using the Channel 1 parameters. You could then orbit this spinning-and-orbiting picture around a different, global center of orbit.

If you have the optional Second Channel in your system, global control allows you to manipulate the two channels together, as if they were a single picture.

[GOTO KF]

(DIRECT ENTRY section) If you have an effect in the current effect space, use this pushbutton to go to a particular key frame in the effect. Press [GOTO KF], key in the key frame number, and press [ENTER].

[HOME/EXIT]

(STREAMLINE™ section) Pressing this pushbutton exits the menu you are in and moves to the menu one level higher. Holding the pushbutton down for 1/2 second returns you to the top-level Home Menu.

[INSERT AFTER]

(KEYFRAME/EDIT section) This pushbutton is active at all times.
- If you are directly on a key frame, pressing [INSERT AFTER] will insert the working key frame into the effect immediately after the key frame you are on. The new key frame will have the same duration as the key frame immediately before it.
- If you are not on a key frame, [INSERT AFTER] functions as an "INSERT" pushbutton; pressing it will insert the working key frame into the current effect at that point. The new key frame will not have a default duration of its own; it will divide the original duration in proportion to its location between the two original key frames.
- If you don't have an effect in the current effect space), pressing [INSERT AFTER] will enter the working key frame into the current effect as Key Frame #1. This key frame will have a default duration of 60 fields.

[INSERT BEFORE]

(KEYFRAME/EDIT section) This pushbutton is active when you have an effect in the current space and you are directly on a key frame. Pressing

[INSERT BEFORE] will insert the working key frame into the effect immediately before the key frame you are on. The new key frame will have the same duration as the key frame immediately before it.

Joystick

(TRANSFORM section) The joystick is used to enter values for transform parameters. It has three different control modes: you can move the lever left/right (X values), forward/backward (Y values), or you can rotate the knob (Z values). These are the same as the [X], [Y], and [Z] values in the DIRECT ENTRY keypad section.

[KEY INVERT]

(KEYER section) Selecting [KEY INVERT] inverts the key signal and allows you to key from a black-on-white source instead of a white-on-black source. That is, the key source video will be inserted over the background video wherever the original key source signal's luminance level is lower than the clip reference level.

[KEY LAYER]

(STREAMLINE™ DIRECT section) Pressing this pushbutton will immediately bring up the KeyLayer™ Menu in the STREAMLINE™ display. This menu contains selections for the following functions:

- Upstream/downstream mode, which allows you to select whether the DPM-700 is operating upstream or downstream of the switcher.
- Key Matte Fill adjustments for luminance, saturation and hue.
- Background selections for either External or Matte, shaping on/off, and Background Matte adjustments for luminance, saturation and hue.

"KEY ON"

(KEYER section) This cutout lights whenever a key is on over the background on the PROGRAM output.

Keypad

(DIRECT ENTRY section) See the entries for 0-9, CLEAR, DETENT, ENTER, and TRIM. The keypad pushbuttons are described in detail under these individual entries.

(E-MEM® section) See the entry for [0]-[9]. Also see [BANK], [LAST X], [LEARN], [RECALL], and [RECALL TO CUR EFF] for details about pushbuttons which work with the E-MEM® keypad.

[KF DUR]

(DIRECT ENTRY section) Select this pushbutton to change the duration time for a key frame in the current effect.

1. Go to the key frame. press [GOTO KF], then the number of the key frame, then [ENTER].
2. Key in the new time as: seconds, decimal point, frames; press [ENTER]. (You can also key in the time as frames-only by leaving out the decimal point; the DPM-700 will automatically convert the number of frames into seconds, decimal point, frames.)
3. Use [INSERT BEFORE], [INSERT AFTER], or [REPLCE] to insert the key frame with its new duration time into the current effect.

To set the overall duration of an entire key frame current effect, see [EFF DUR].

Knob

See CLIP knob, GAIN knob, STREAMLINE™ knob.

[LAST X]

(E-MEM® section) This pushbutton provides an "undo" function for your most recent E-MEM® [LEARN] or [RECALL TO CUR EFF] operation.

- Performing a learn into a register erases any data which was previously learned into that register. To retrieve the erased data (undo the learn), press [LAST X].
- Performing a [RECALL TO CUR EFF] operation erases the current effect. To retrieve the erased data (undo the recall to current effect), press [LAST X].

[LEARN]

(E-MEM® section) A learn operation stores the key frame effect which is in the current effect space into an E-MEM® register. There are three [LEARN] pushbuttons; you can select one, two, or all three of them at the same time. To select all three at once, hold down the [LEARN CH 1] pushbutton for 1/2 second.

- Select [LEARN CH 1] to learn only the Channel 1 current effect parameters ;
- Select [LEARN CH 2] to learn only the Channel 2 current effect parameters ;
- Select [LEARN GLOBAL] to learn only the global control current effect parameters. Note that many important effect parameters, such as Background Colors and Key Background selection, are learned as part of Global key frames and not on a per-channel basis; it is good practice to select Global delegation whenever you learn a key frame.

After you perform a learn, the [LEARN] pushbutton (s) will go dark and the corresponding [RECALL] pushbutton(s) will light. To undo a [LEARN] operation, see the [LAST X] entry.

Lever

(TRANSITION section) The lever is used to manually perform a transition or to run the current effect. Four pushbuttons—[COMBINER], [OUTPUT KEY], [EFFECT], and [FTB]— are used to delegate the lever to the desired function as follows:

- [COMBINER]: This pushbutton is active only if the optional Second Channel is installed in the system. When [COMBINER] is active, the lever will perform a manual transition between the two channels. Each movement of the lever from one limit to the other performs one complete transition.
- [KEY]: The lever will perform a manual transition which will insert the key over the PROGRAM output background or remove it, depending on its current state. Each movement of the lever from one limit to the other performs one complete transition.
- [EFFECT]: Moving the lever will cause the current effect to run under manual control. In normal mode ([STOP/NEXT] off), each movement of the lever from one limit to the other performs the entire current effect once. When [STOP/NEXT] is selected (lighted), each movement of the lever from one limit to the other will step through one key frame of the effect. Note that you can change the direction of the lever between limits and move it forward and backward; the effect will then run forward and backward.
- [FTB]: The lever will perform a manual transition which will fade the system into or up from black, depending on its current state. Each movement of the lever from one limit to the other performs one complete transition.

[LINEAR KEY]

(KEYER section) When this pushbutton and [SELF KEY] are selected, the keyer will produce a linear key. A linear key, unlike a luminance key, does not shape the key source signal. At unity gain (gain = 1), a linear key's edge will have exactly the same shape and softness as the key source input. Linear keys are used when the key signal edge has been pre-shaped at the source and requires little or no further shaping by the DPM-700 keyer.

The CLIP and GAIN control knobs are used for both luminance and linear keys, but the values for each are stored separately. The controls are delegated to linear key whenever [SELF KEY] and [LINEAR KEY] are both selected.

- The CLIP control knob sets the dc reference level which is compared to the key source luminance level; a "hole" will be cut in the background wherever the key level is greater than the clip reference level. Adjust the CLIP control knob for the desired key hole shape. The clip range is from 0 to 110 IRE units. Turning the knob counterclockwise lowers the clip reference level. At its full counterclockwise setting, the key fill signal will fill the entire screen.
- The GAIN control determines the sharpness of the key edge. The gain range is 0 to 130 in NTSC systems. At unity gain (gain = 1), the key edge will be the same as the key source input signal; this is a true linear key, although the DPM-700 allows gain to be adjusted over a wider range. As gain decreases, edge softness will also increase because the change between the background and key fill signals will take place more slowly, with more mixing of the two signals at the point of change.

For more details about luminance and self keys, please refer to the "[SELF KEY]" entry in this dictionary.

[LOCATE 3D]

(TRANSFORM section) Selecting this pushbutton delegates the joystick and the DIRECT ENTRY keypad to the locate function and allows you to move the picture anywhere in 3D space.

- To move the picture along the X axis of the screen, move the joystick left or right or select [X] in the DIRECT ENTRY section, key in a value, and press [ENTER]. You can move the picture off-screen.
- To move the picture along the Y axis of the screen, move the joystick forward or backward or select [Y] in the DIRECT ENTRY section, key in a value, and press [ENTER]. You can move the picture off-screen.
- To move the picture closer to or further from the front plane of the screen along the Z axis, turn the joystick knob or select [Z] in the DIRECT ENTRY section, key in a value, and press [ENTER]. Note that although the picture will appear larger when it is moved closer, this is not a true size function; always use the [SIZE] pushbutton to adjust the

picture's size. Using the Locate function instead of the Size function could produce unexpected results when you manipulate pictures in 3D space, especially in regard to picture priority (which picture is in front of the other) or when used in source mode.

[LOCATE 3D], [ROT 3D], and [SPIN] are mutually exclusive pushbuttons; one will always be on, but never more than one.

Luminance Key

See [SELF KEY].

[MATTE FILL]

(KEYER section) When the [MATTE FILL] pushbutton is selected, the key will be filled with a solid matte color generated by the DPM-700. (When [MATTE FILL] is off, the key fill will be the manipulated input video.)

To adjust the matte fill color, press [KEY LAYER] to bring up the KeyLayer™ STREAMLINE™ menu and then select {Keymat} from the menu. The next menu which appears lets you select luminance, saturation, or hue for adjustment. Press {Luma}, {Sat}, or {Hue}, respectively, and use the STREAMLINE™ soft knob to make the adjustment. Note that this matte generator is separate from the background matte generator; matte fill and matte background must be adjusted independently.

[MODIFY]

(STREAMLINE™ DIRECT section) Pressing this pushbutton will immediately bring up the Modify Menu in the STREAMLINE™ display. This menu contains selections for the following functions:

- Modify All, which allows you to adjust all key frames in an effect in the same way and at the same time.
- Copying an effect from one channel to the other channel.
- Copying the working key frame from one channel to the other channel.
- Saving the working key frame into a buffer (it can be restored later in the same place or in a different place in the effect).

[NEAR]

(INPUT section) Press [NEAR] and then select an input; the selected input will be assigned to the near or front side of the DPM-700 picture on the delegated channel(s).

- If you are using the standard A/B inputs or a 10x1 input router, the appropriate Input Selector menu will appear in the display automatically when you press [NEAR].
- If you are using a Model 200 Aux Bus as an input selector, use the Aux Bus control panel to select the input.

[NEXT]

(KEYFRAME section) Pressing [NEXT] moves you immediately to the next key frame in the effect sequence. The [NEXT] pushbutton will be lighted to show that the function is active. If you are on the last key frame, [NEXT] will be inactive.

[OUTPUT KEY]

(TRANSITION section) Selecting [OUTPUT KEY] delegates the [AUTO TRANS] and [CUT] pushbuttons and the lever to the keyer function, as follows:

- Pressing [AUTO TRANS] will perform an automatic transition of the key to insert it into or remove it from the PROGRAM and CLEAN FEED outputs, depending on its current status. The transition will take place at the rate selected using the Misc Menu (select {Dur} and then {KEY} and use the soft knob or Direct Entry keypad to enter the desired rate).
- Pressing [CUT] performs an immediate transition of the key, inserting the key into the background or removing it, depending on its current state.
- Moving the lever will bring the key on over the background or will remove it from the background, depending on its current state. Moving the lever from one limit to the other will perform one complete key transition.

[PERSPECTIVE]

(TRANSFORM/SECONDARY TRANSFORMS section) Selecting this pushbutton delegates the joystick and the DIRECT ENTRY keypad to the perspective function and allows you to adjust the amount of perspective.

[POST XFORM]

(TRANSFORM/SECONDARY TRANSFORMS section) Select [POST XFORM] to turn on post transform mode. In this mode, the manipulated picture will always appear to the viewer from the same relative angle, even if it is being moved and rotated through 3D space.

[PREV]	(KEYFRAME section) Pressing [PREV] moves you immediately to the previous key frame in the effect sequence. The [PREV] pushbutton will be lighted to show that this function is active. If you are on the first key frame, [PREV] will be inactive.
[RECALL]	(E-MEM® section) There are three RECALL pushbuttons; you can select one, two, or all three of them at the same time. To select all three at once, hold down the [RECALL CH 1] pushbutton for 1/2 second. • Select [RECALL CH 1] to recall the Channel 1 parameters only; • Select [RECALL CH 2] to recall the Channel 2 parameters only; • Select [RECALL GLOBAL] to recall the global path control parameters only. Selecting one or more of the [RECALL] pushbuttons prepares the system for a recall operation on the selected paths, as follows: • If [RECALL TO CUR EFF] is on, pressing a numbered register pushbutton will cause the recalled effect to be placed into the key frame current effect space. • If [RECALL TO CUR EFF] is off, pressing a numbered register pushbutton will cause the recalled effect to be performed immediately; it will not be placed into the current effect space.
[RECALL TO CUR EFF]	(E-MEM® section) This is an on-off pushbutton. When it is on, performing a recall operation will place the recalled effect in the key frame current effect space. When [RECALL TO CUR EFF] is off, performing a recall operation will cause the recalled effect to be performed immediately; it will not be placed into the current effect space. To undo a [RECALL TO CUR EFF] operation, see the [LAST X] entry.
[RECURS MEM]	(STREAMLINE™ DIRECT section) Pressing this pushbutton will immediately bring up the Recursive Memory Menu in the STREAMLINE™ display. This menu contains selections for the following functions: Trails, Montages, the Subtraction effect, Clear Event (this clears the screen whenever a key frame it is stored in is run), and Clear (this clears recursive pictures from the screen without changing the mode of operation).

[REPLCE]

(KEYFRAME/EDIT section) If you are exactly on a key frame in a current effect on an active (delegated) path, pressing [REPLCE] replaces that key frame with the key frame that is in the working key frame buffer. The [REPLCE] pushbutton will be lighted to show that this function is active. It will be dark and inactive if you are between key frames in an effect.

[RESTOR WORKNG KF]

(KEYFRAME/EDIT section) You can use this function to undo the most recent [CLEAR WORKNG KF] or [DELETE] operation. You can also use it to delete or copy a key frame and move it another place in the current effect.

- To undo a [CLEAR WORKNG KF] operation, simply press [RESTOR WORKNG KF]. The cleared data will immediately be restored to the working key frame buffer.
- To undo a [DELETE] operation, press [RESTOR WORKNG KF] to restore the deleted data to the working key frame buffer. You can now use [INSERT AFTER], [INSERT BEFORE], or [REPLCE] to insert the working key frame into the current effect, either in the same place it was before or in a new location.

[REV]

(EFFECT section) The [REV] function reverses the direction of movement of the current effect. When [REV] is selected:

- Pressing [REWIND] will move you to the last key frame in the effect and stop there.
- Pressing [RUN] or moving the lever from one limit towards the other will cause the effect to run backwards.

[REWIND]

(EFFECT section) In normal mode ([REV] off), pressing [REWIND] will move you back to the first key frame in the current effect and stop there. When [REV] is selected, pressing [REWIND] will move you to the last key frame in the effect and stop there.

[ROT 3D]

(TRANSFORM section) The rotation function is used to position a picture around its X, Y, and Z axes (the spin function is used for multiple rotations). Selecting [ROT 3D] delegates the joystick and the DIRECT ENTRY keypad to the rotation transform parameters, as follows.

- To adjust the picture's X axis rotation value, move the joystick left or right or select [X] in the DIRECT ENTRY section, key in a value, and press

[ENTER]. The picture will appear to rotate (compress and expand) around its Y axis.
- To adjust the picture's Y axis rotation value, move the joystick backward or forward or select [Y] in the DIRECT ENTRY section, key in a value, and press [ENTER]. The picture will appear to rotate (compress and expand) around its X axis.
- To rotate the picture around its Z axis, turn the joystick or select [Z] in the DIRECT ENTRY section, key in a value, and press [ENTER].

[LOCATE 3D], [ROT 3D], and [SPIN] are mutually exclusive pushbuttons; one will always be on, but never more than one.

[RUN]

(EFFECT section) The [RUN] pushbutton is used to run or step through an effect, as follows:
- In normal mode ([STOP/NEXT] off, [REV] off), pressing [RUN] will cause the current effect to run from beginning to end.
- When [STOP/NEXT] is selected (lighted), pressing [RUN] will step through one key frame of the effect with each press.
- When [REV] is selected, pressing [RUN] will run the effect backwards, from the last key frame to the first.

[SELF KEY]

(KEYER section) This pushbutton is used to select between transform keys and self (luminance/linear) keys, as follows:
- If [SELF KEY] is off, the keyer will produce a transform key. A transform key uses the entire manipulated picture (the raster) as the key signal. The KEYER CLIP and GAIN controls have no effect on transform keys.
- If [SELF KEY] is selected, the keyer will produce a luminance or linear key, depending on whether the [LINEAR KEY] pushbutton is selected:
  - If [LINEAR KEY] is on, the keyer will produce a linear key. Linear keys are a special kind of luminance key and are described in detail under the "[LINEAR KEY]" entry in this dictionary.
  - If [LINEAR KEY] is off, the keyer will produce a luminance key. For a luminance key, the key source video is inserted over the background video wherever the key source luminance level is higher than a clip reference level set by the

operator. Luminance keys are recommended instead of linear keys when the key source signal needs shaping to avoid a mock-banding effect on the edges of the key.

The CLIP and GAIN control knobs are used for both luminance and linear keys, but the values for each are stored separately. As noted before, the controls are delegated to luminance key whenever [SELF KEY] is on and [LINEAR KEY] is off. In luminance key mode, the controls operate as follows:

- The CLIP control knob sets the dc reference level which is compared to the key luminance source; a "hole" will be cut in the background wherever the key level is greater than the clip reference level. Adjust the CLIP control knob for the desired key hole shape. The clip range is from 0 to 110 IRE units. Turning the knob counterclockwise lowers the clip reference level. At its full counterclockwise setting, the key will be full-on.
- The GAIN control determines the sharpness of the key edge. For a luminance key, the gain range is 0 to 130 in NTSC systems. At unity gain (gain = 1), the key edge will be the same as the key source input signal. As gain increases, edge softness will also increase because the change between the background and key fill signals will take place more slowly, with more mixing of the two signals at the point of change.

[SIZE]

(TRANSFORM/SECONDARY TRANSFORMS section) Selecting [SIZE] delegates the joystick and the DIRECT ENTRY keypad to the size function, as follows:

- To make the picture larger or smaller horizontally, delegate the panel to one or both channels, then move the joystick knob left or right or select [X] in the DIRECT ENTRY section, key in a value, and press [ENTER]. (There is no X parameter for the Global path.) Resizing the X value will change the aspect of the picture.
- To make the picture larger or smaller vertically, delegate the panel to one or both channels, then move the joystick knob forward or backward or select [Y] in the DIRECT ENTRY section, key in a value, and press [ENTER]. (There is no Y parameter for the Global path.) Resizing the Y value will change the aspect of the picture.

- To make the entire picture larger or smaller in proportion (no change in aspect), turn the joystick knob or select [Z] in the DIRECT ENTRY section, key in a value, and press [ENTER]. When you adjust Z size, the picture will appear to move closer to or further from the front plane of the screen along the Z axis, just as when you adjust Z location; however, it is important to note that in this case only the size of the picture has changed and not its location. Always use the [LOCATE 3D] pushbutton to position the picture along the Z axis. Using the Size function instead of the Locate function could produce unexpected results when you manipulate pictures in 3D space, especially in regard to picture priority (which picture is in front of the other).

[SKEW]

(TRANSFORM/SECONDARY TRANSFORMS section) Selecting this pushbutton delegates the joystick and DIRECT ENTRY keypad to the skew function. Moving the joystick left/right adjusts the slant of the picture on its horizontal (X) axis; moving the joystick forward/backward adjusts the slant of the picture on its vertical (Y) axis. There is no Z parameter for skew.

Soft controls

(STREAMLINE™ section) "Soft" controls are those which change their functions depending on which programs are currently being run. That is, their functions are determined by software rather than being fixed and unchanging.

The STREAMLINE™ section of the control panel contains one soft control knob and six soft pushbuttons. Each pushbutton is marked with a triangle pointing up towards the STREAMLINE™ display; this indicates that the display is used to label the pushbuttons according to their current functions. For example, the leftmost pushbutton will be labelled {Width} under the STREAMLINE™ {Border} program and {Router} under the {Person} program.

[SOURCE]

(TRANSFORM section) Selecting [SOURCE] turns source mode on and off. In source mode, pictures are manipulated in relationship to their own X, Y, Z parameters instead of the video monitor parameters. For example, if you first rotate a picture 90° and then use [LOCATE 3D] to change its X value, it will move along its own X axis instead of moving left/right on the monitor.

[SPIN]

(TRANSFORM section) The spin function is used to spin a picture repeatedly around a point in 3D space (the rotate function is used to position a picture around its own X, Y, and/or Z axes). Normally spin is applied to one axis only to produce a smooth effect, but you can use all three axes if desired. Selecting [SPIN] delegates the joystick and the DIRECT ENTRY keypad to the rotation transform parameters, as follows.

- To spin the picture by adjusting its X axis spin value, move the joystick left or right or select [X] in the DIRECT ENTRY section, key in a value, and press [ENTER]. The picture will appear to spin around its Y axis.
- To spin the picture by adjusting its Y axis spin value, move the joystick forward or backward or select [Y] in the DIRECT ENTRY section, key in a value, and press [ENTER]. The picture will appear to spin around its X axis.
- Spin: To spin the picture around its own center (its Z axis), turn the joystick knob or select [Z] in the DIRECT ENTRY section, key in a value, and press [ENTER].

[LOCATE 3D], [ROT 3D], and [SPIN] are mutually exclusive pushbuttons; one will always be on, but never more than one.

[STOP/NEXT]

(EFFECT section) Select this pushbutton if you want to run the current effect step by step (one key frame at a time) instead of all at once. When the [STOP/ NEXT] pushbutton is selected:

- Pressing [RUN] performs one key frame and stops at the next.
- Moving the lever from one limit to the other performs one key frame and stops at the next.

STREAMLINE™ knob

(STREAMLINE™ section) The STREAMLINE™ knob is a "soft" control which changes its function depending on which program is currently being run. That is, its function is determined by software rather than being fixed and unchanging.

The STREAMLINE™ section of the control panel contains a display located to the left of the control knob. The upper right-hand corner of the display is used to label the knob according to its current function. For example, if you select {Key Layer}, {Bkgnd}, and {Hue}

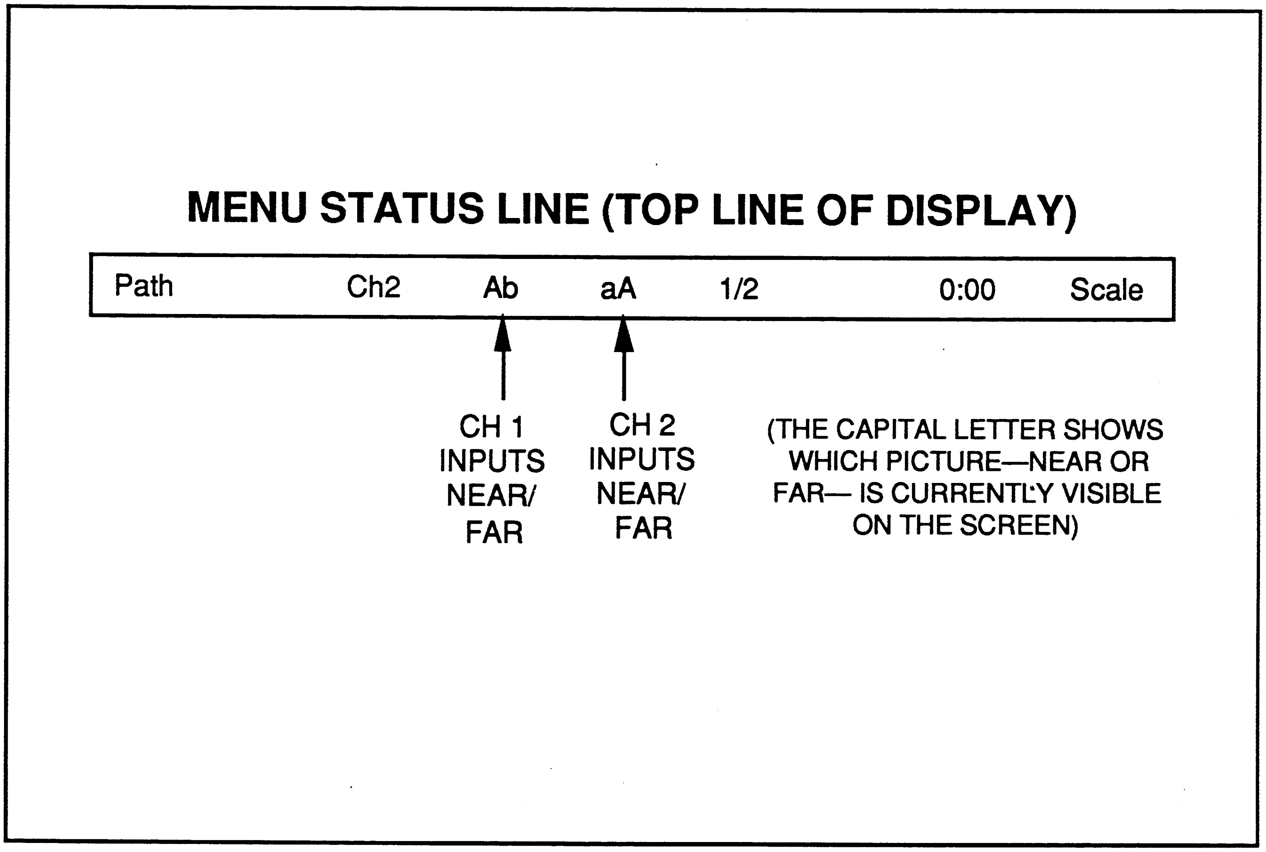
	from the STREAMLINE™ menus, the knob will be labelled "Hue;" if you select {Border}, {Width}, and {Top}, the knob will be labelled "Top."
[TRIM]	(DIRECT ENTRY section) Trimming is a way of adding a precise value to the current X, Y, or Z values. For example, if X = 1.3 for a location transformation and you trim the X value by -1.9, the new X value will be -0.6. To use trim, first select one of the TRANSFORM pushbuttons. Then select [X], [Y], or [Z], key in the value you want to add, and press [TRIM] .
[X]	(DIRECT ENTRY section) Pressing [X] delegates the DIRECT ENTRY keypad to the X value for the currently selected TRANSFORM function. That is, if you select [X], key in a value, and then press [ENTER], the value you entered becomes the current X value for the transform. If you press [TRIM] instead of [ENTER], the value you keyed in would be added to the current X value.
[Y]	(DIRECT ENTRY section) Pressing [Y] delegates the DIRECT ENTRY keypad to the Y value for the currently selected TRANSFORM function. That is, if you select [Y], key in a value, and then press [ENTER], the value you entered becomes the current Y value for the transform. If you press [TRIM] instead of [ENTER], the value you keyed in would be added to the current Y value.
[Z]	(DIRECT ENTRY section) Pressing [Z] delegates the DIRECT ENTRY keypad to the Z value for the currently selected TRANSFORM function. That is, if you select [Z], key in a value, and then press [ENTER], the value you entered becomes the current Z value for the transform. If you press [TRIM] instead of [ENTER], the value you keyed in would be added to the current Z value.

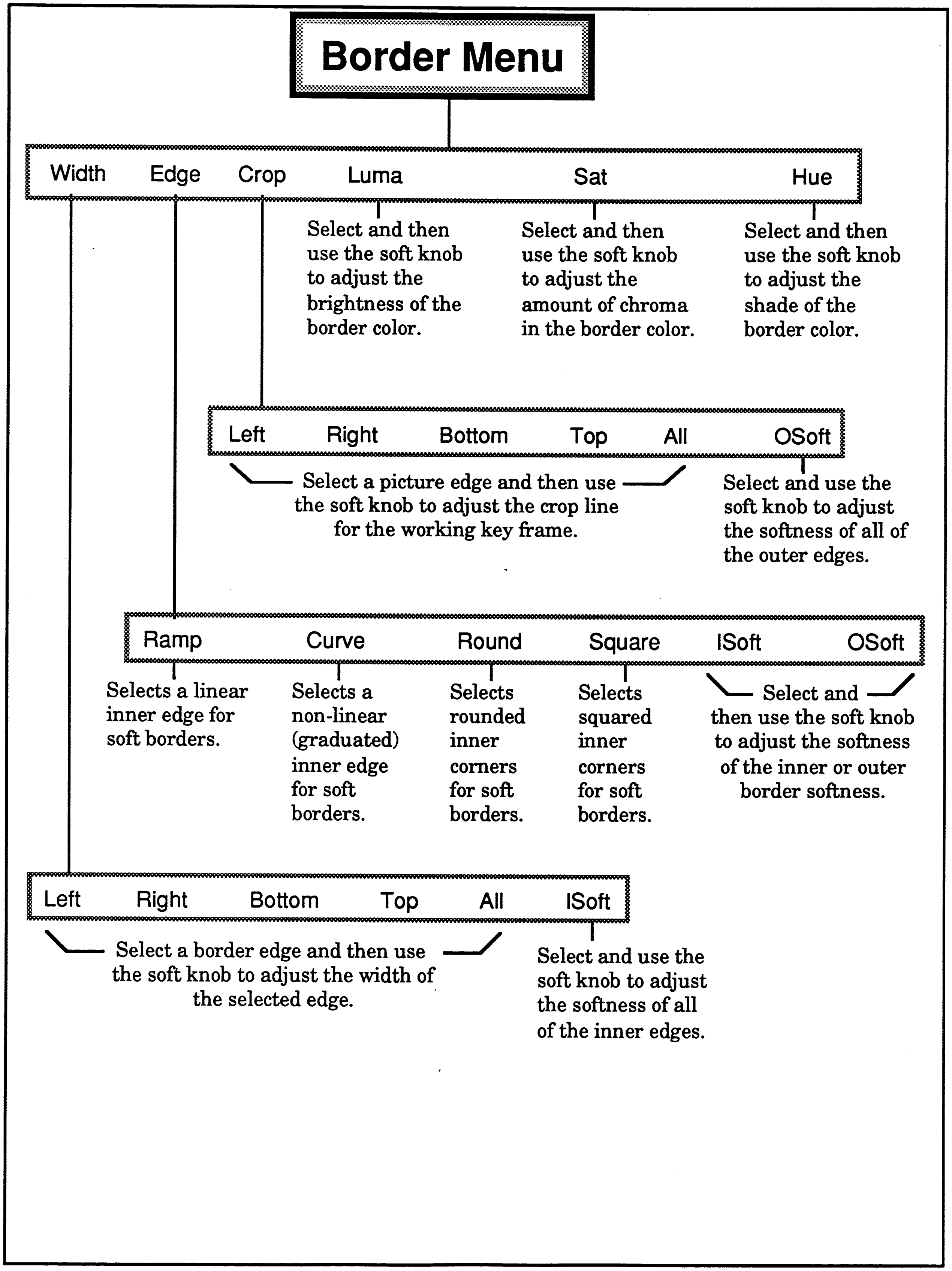
STREAMLINE™ MENUS

The following pages contain menu trees for each of the STREAMLINE™ programs. Each menu tree shows all of the different menu levels, with brief descriptions of each menu pushbutton selection (pushbuttons are labelled in the bottom line of the display).

The display also has a status line (the top line) which contains information about the current status of the DPM-700, as shown below.

For detailed, step-by-step information about operations, refer to the Basic Effects and Advanced Effects section of the DPM-700 Operator Handbook.


MENU STATUS LINE (TOP LINE OF DISPLAY)
Path
Ch2
Ab
aA
1/2
0:00
Scale
CH 1 INPUTS NEAR/ FAR
CH 2 INPUTS NEAR/ FAR
(THE CAPITAL LETTER SHOWS WHICH PICTURE—NEAR OR FAR— IS CURRENTLY VISIBLE ON THE SCREEN)


Border Menu
Width
Edge
Crop
Luma
Sat
Hue
Left
Right
Bottom
Top
All
OSoft
Ramp
Curve
Round
Square
ISoft
OSoft
Left
Right
Bottom
Top
All
ISoft

Luma: Select and then use the soft knob to adjust the brightness of the border color.

Sat: Select and then use the soft knob to adjust the amount of chroma in the border color.

Hue: Select and then use the soft knob to adjust the shade of the border color.

Crop – Left, Right, Bottom, Top, All: Select a picture edge and then use the soft knob to adjust the crop line for the working key frame.

Crop – OSoft: Select and use the soft knob to adjust the softness of all of the outer edges.

Ramp: Selects a linear inner edge for soft borders.

Curve: Selects a non-linear (graduated) inner edge for soft borders.

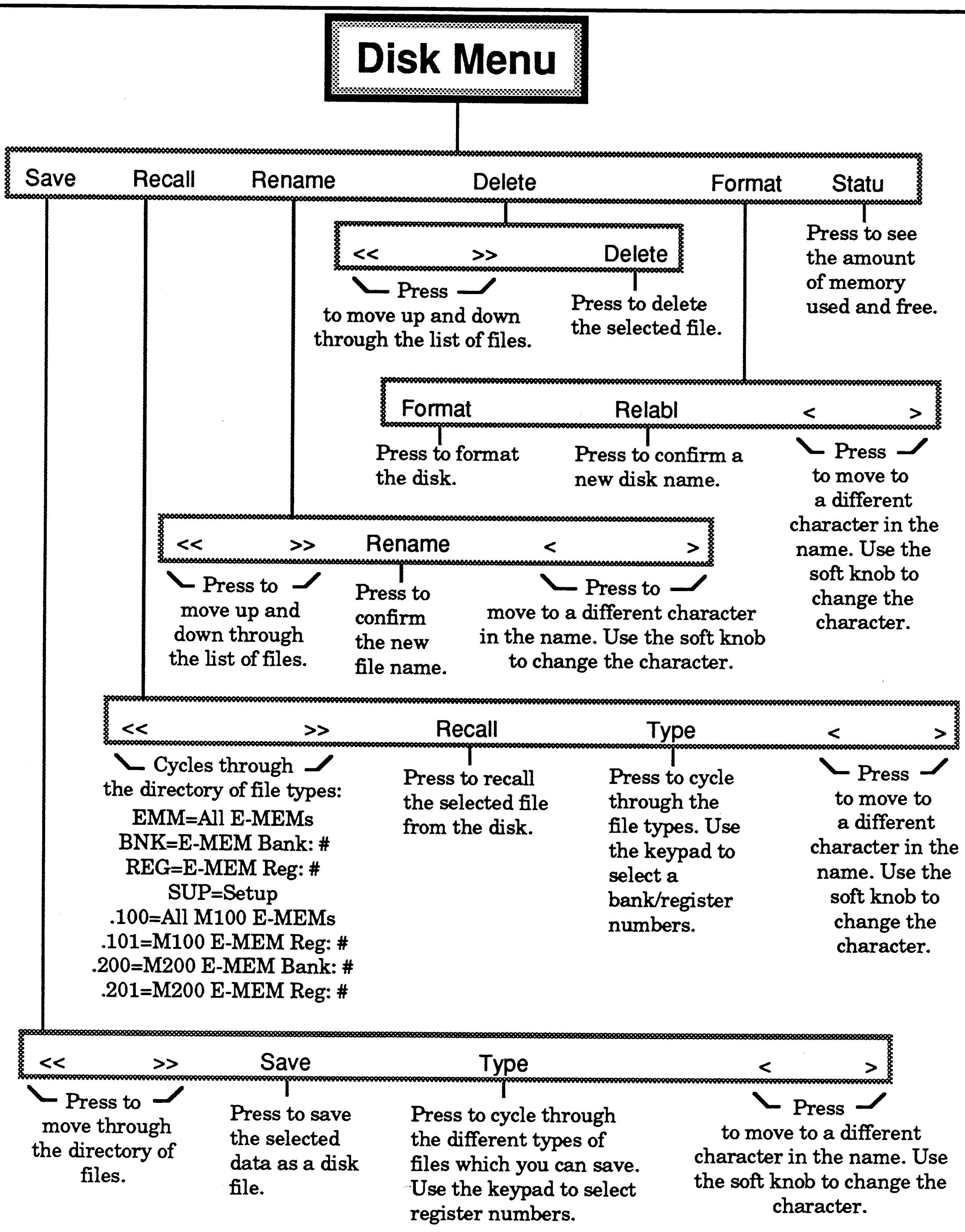
Round: Selects rounded inner corners for soft borders.

Square: Selects squared inner corners for soft borders.

ISoft, OSoft: Select and then use the soft knob to adjust the softness of the inner or outer border softness.

Width – Left, Right, Bottom, Top, All: Select a border edge and then use the soft knob to adjust the width of the selected edge.

Width – ISoft: Select and use the soft knob to adjust the softness of all of the inner edges.



Statu: Press to see the amount of memory used and free.

Delete menu:

<< >> Press to move up and down through the list of files.

Delete: Press to delete the selected file.

Format menu:

Format: Press to format the disk.

Relabl: Press to confirm a new disk name.

< > Press to move to a different character in the name. Use the soft knob to change the character.

Rename menu:

<< >> Press to move up and down through the list of files.

Rename: Press to confirm the new file name.

< > Press to move to a different character in the name. Use the soft knob to change the character.

Recall menu:

<< >> Cycles through the directory of file types:
EMM=All E-MEMs
BNK=E-MEM Bank: #
REG=E-MEM Reg: #
SUP=Setup
.100=All M100 E-MEMs
.101=M100 E-MEM Reg: #
.200=M200 E-MEM Bank: #
.201=M200 E-MEM Reg: #

Recall: Press to recall the selected file from the disk.

Type: Press to cycle through the file types. Use the keypad to select a bank/register numbers.

< > Press to move to a different character in the name. Use the soft knob to change the character.

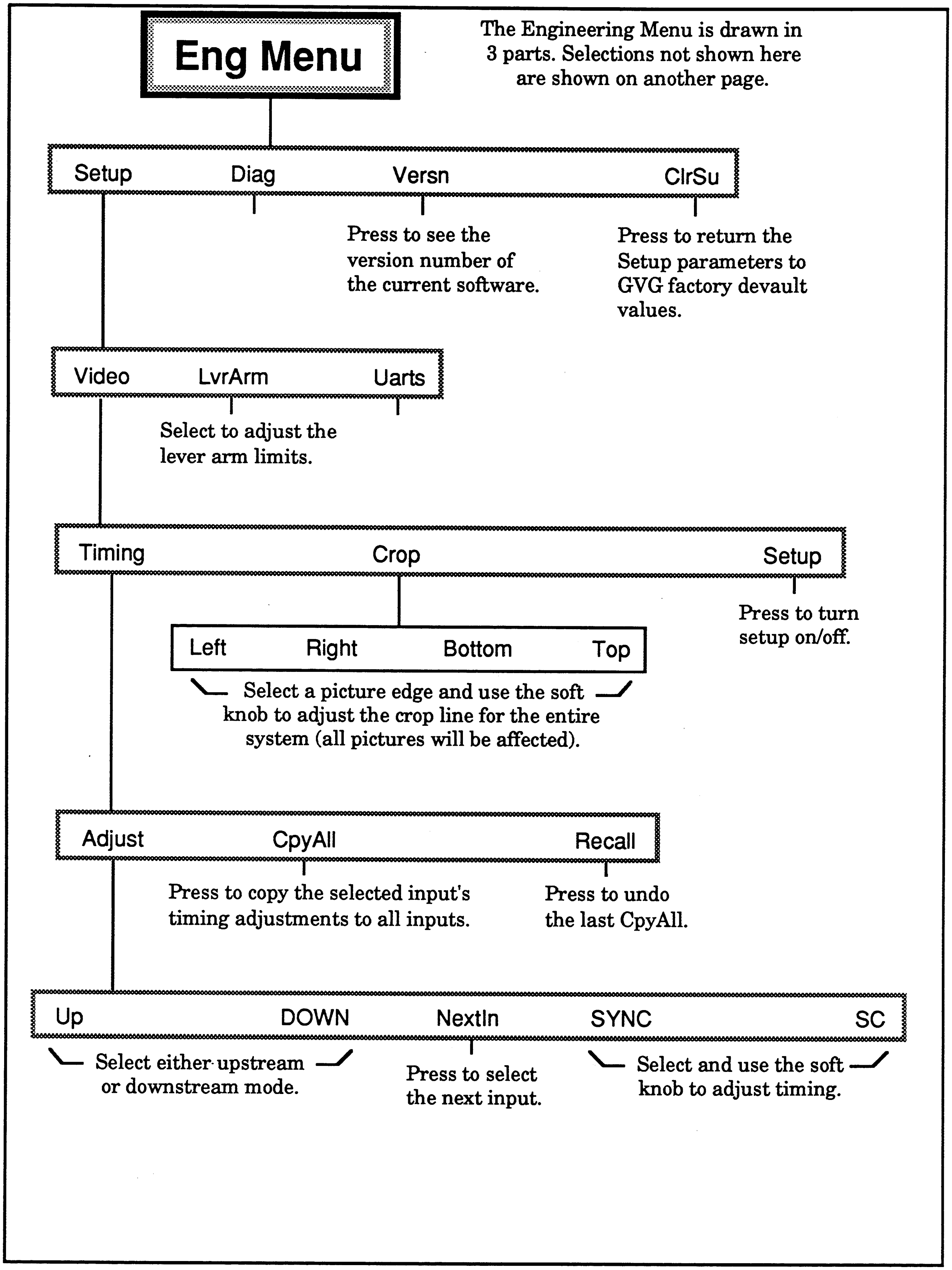
Save menu:

<< >> Press to move through the directory of files.

Save: Press to save the selected data as a disk file.

Type: Press to cycle through the different types of files which you can save. Use the keypad to select register numbers.

< > Press to move to a different character in the name. Use the soft knob to change the character.


Eng Menu
Setup
Diag
Versn
ClrSu
Video
LvrArm
Uarts
Timing
Crop
Setup
Left
Right
Bottom
Top
Adjust
CpyAll
Recall
Up
DOWN
NextIn
SYNC
SC

The Engineering Menu is drawn in 3 parts. Selections not shown here are shown on another page.

Press to see the version number of the current software.

Press to return the Setup parameters to GVG factory devault values.

Select to adjust the lever arm limits.

Press to turn setup on/off.

Select a picture edge and use the soft knob to adjust the crop line for the entire system (all pictures will be affected).

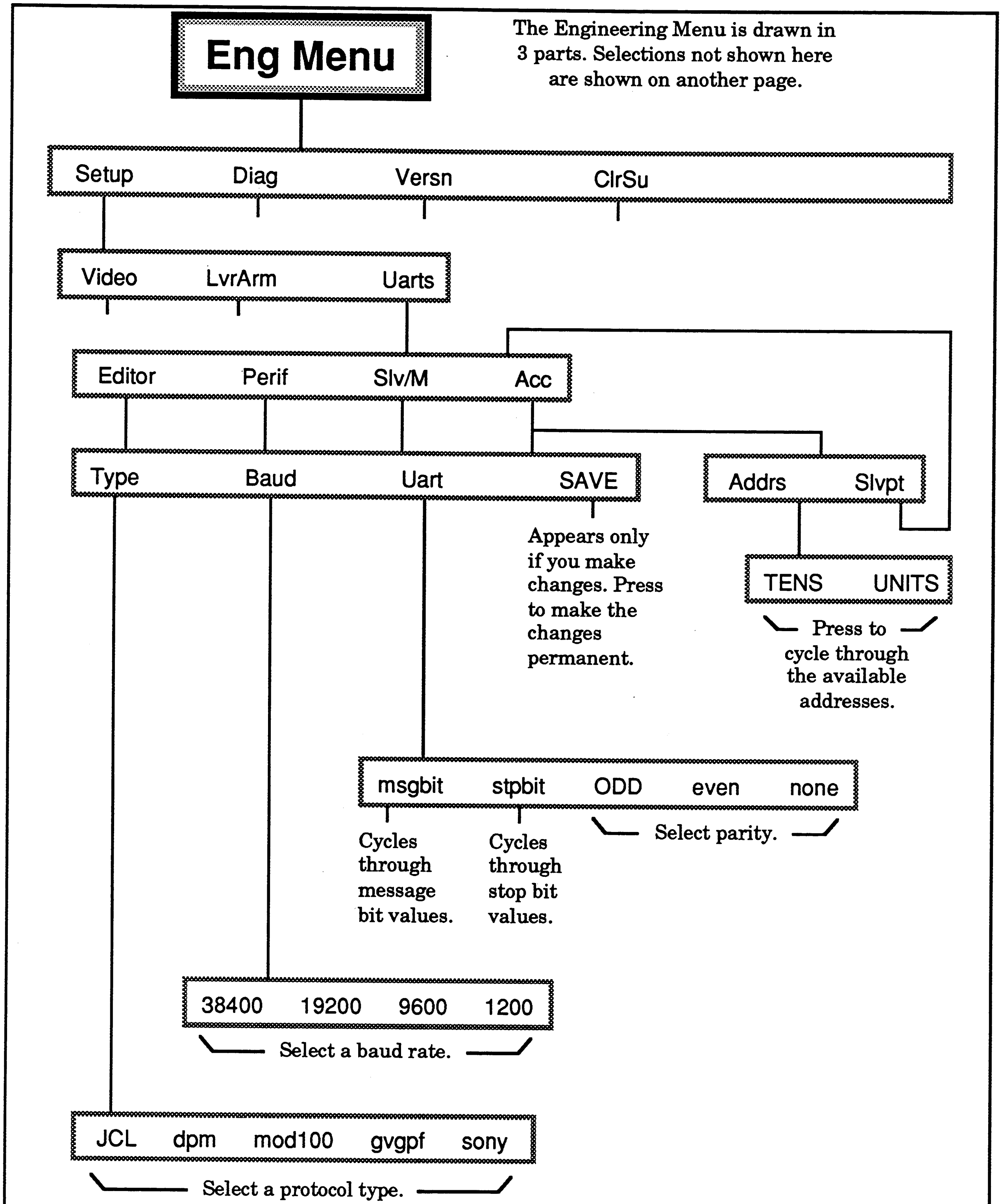
Press to copy the selected input's timing adjustments to all inputs.

Press to undo the last CpyAll.

Select either upstream or downstream mode.

Press to select the next input.

Select and use the soft knob to adjust timing.


Eng Menu
Setup
Diag
Versn
ClrSu
Video
LvrArm
Uarts
Editor
Perif
Slv/M
Acc
Type
Baud
Uart
SAVE
Addrs
Slvpt
TENS
UNITS
msgbit
stpbit
ODD
even
none
38400
19200
9600
1200
JCL
dpm
mod100
gvgpf
sony

The Engineering Menu is drawn in 3 parts. Selections not shown here are shown on another page.

Appears only if you make changes. Press to make the changes permanent.

Press to cycle through the available addresses.

Cycles through message bit values.

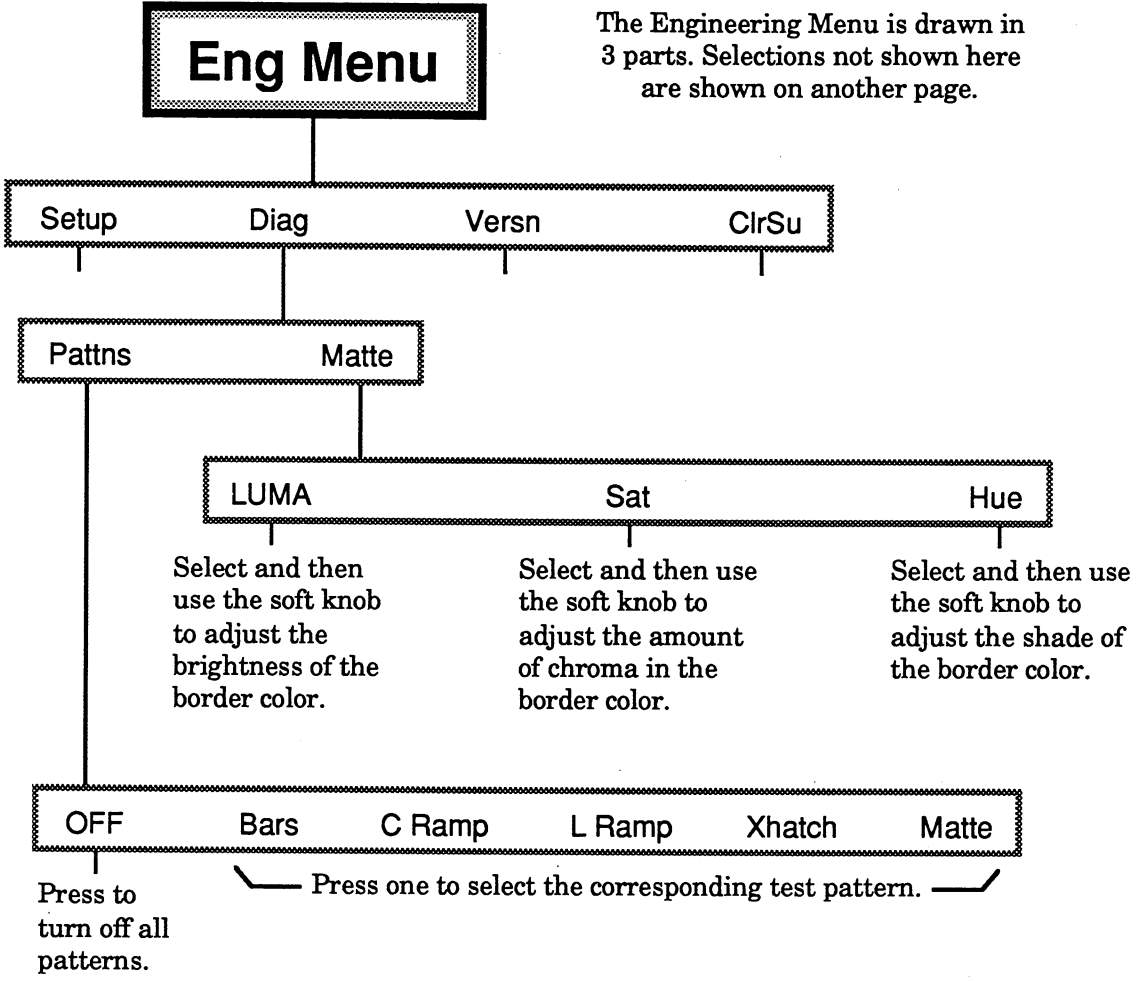
Cycles through stop bit values.

Select parity.

Select a baud rate.

Select a protocol type.

The Engineering Menu is drawn in 3 parts. Selections not shown here are shown on another page.


Eng Menu
Setup
Diag
Versn
ClrSu
Pattns
Matte
LUMA
Sat
Hue
OFF
Bars
C Ramp
L Ramp
Xhatch
Matte

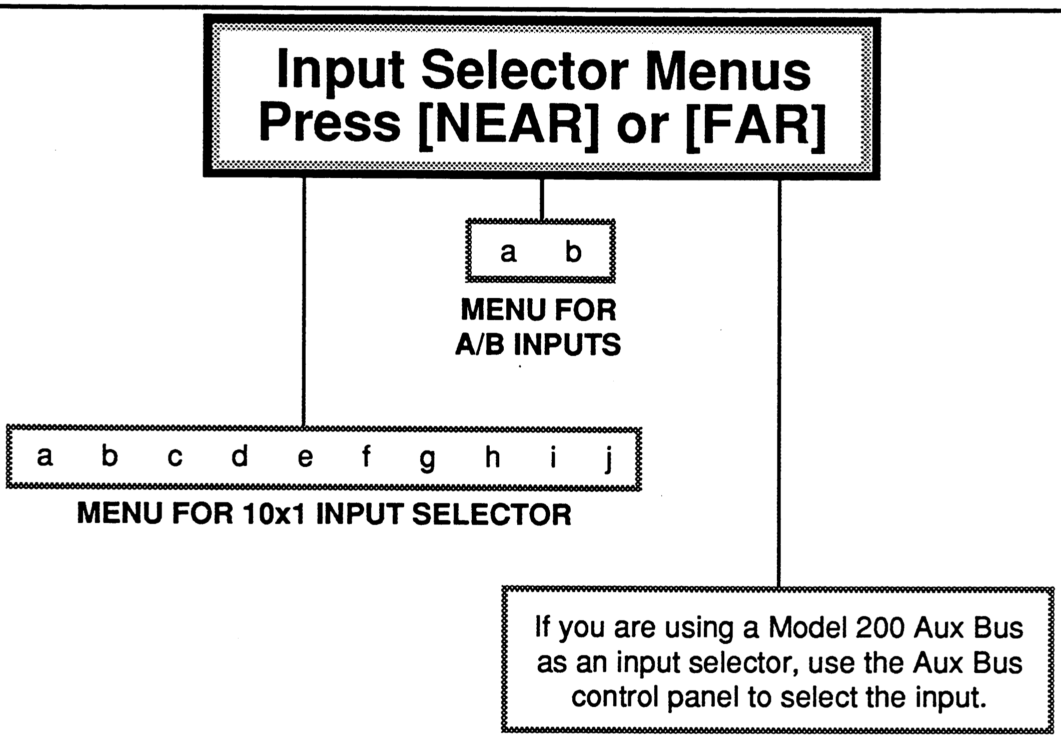
Select and then use the soft knob to adjust the brightness of the border color.

Select and then use the soft knob to adjust the amount of chroma in the border color.

Select and then use the soft knob to adjust the shade of the border color.

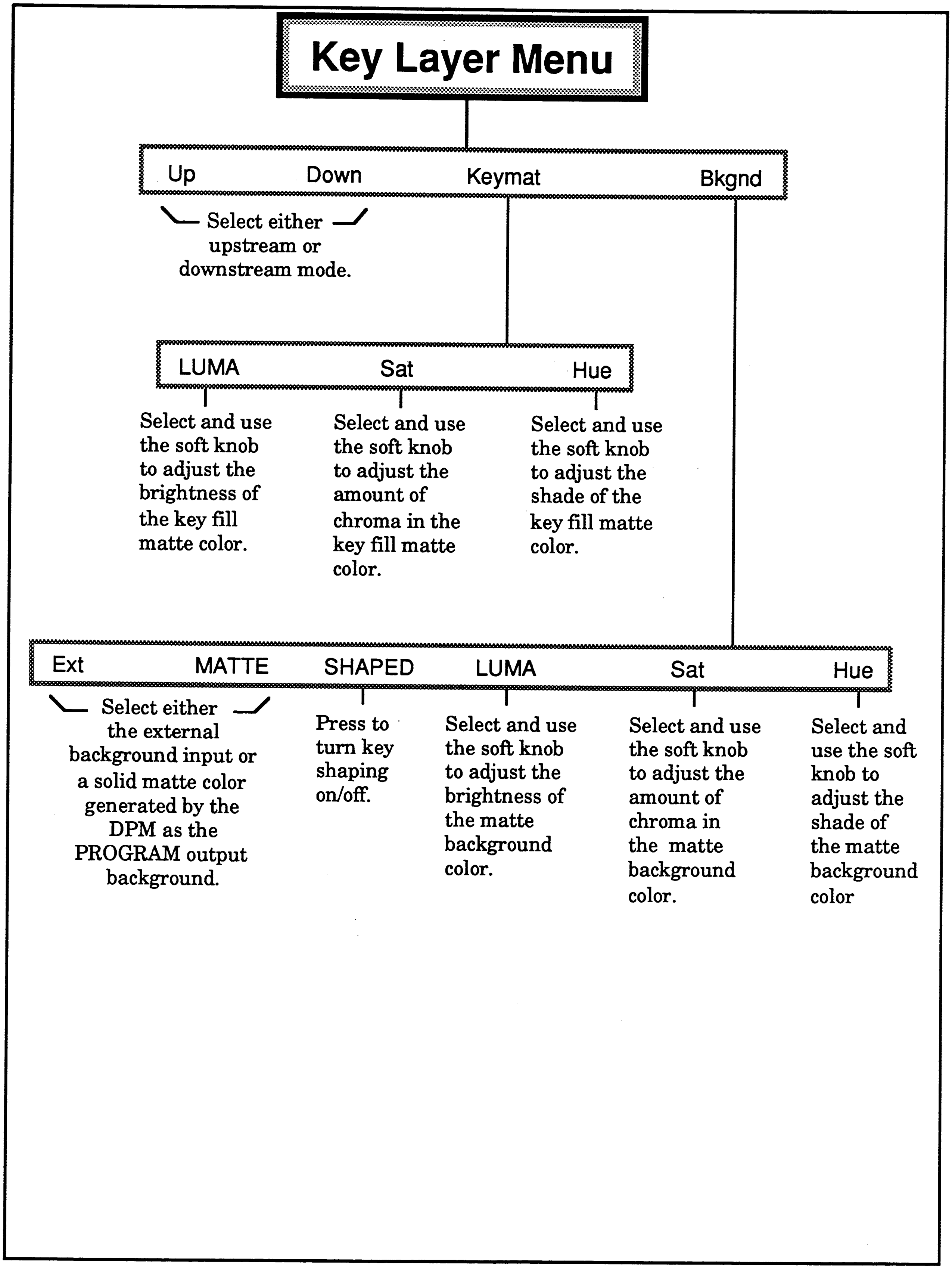
Press to turn off all patterns.

Press one to select the corresponding test pattern.


Input Selector Menus
Press [NEAR] or [FAR]
a b
MENU FOR
A/B INPUTS
a b c d e f g h i j
MENU FOR 10x1 INPUT SELECTOR

If you are using a Model 200 Aux Bus as an input selector, use the Aux Bus control panel to select the input.

Use the {Person} and {Router} menus to select either the standard A/B inputs, the optional 10x1 Input Selector, or an optional Model 200 Aux Bus to supply the inputs to your DPM-100.



Up / Down: Select either upstream or downstream mode.

LUMA: Select and use the soft knob to adjust the brightness of the key fill matte color.

Sat: Select and use the soft knob to adjust the amount of chroma in the key fill matte color.

Hue: Select and use the soft knob to adjust the shade of the key fill matte color.

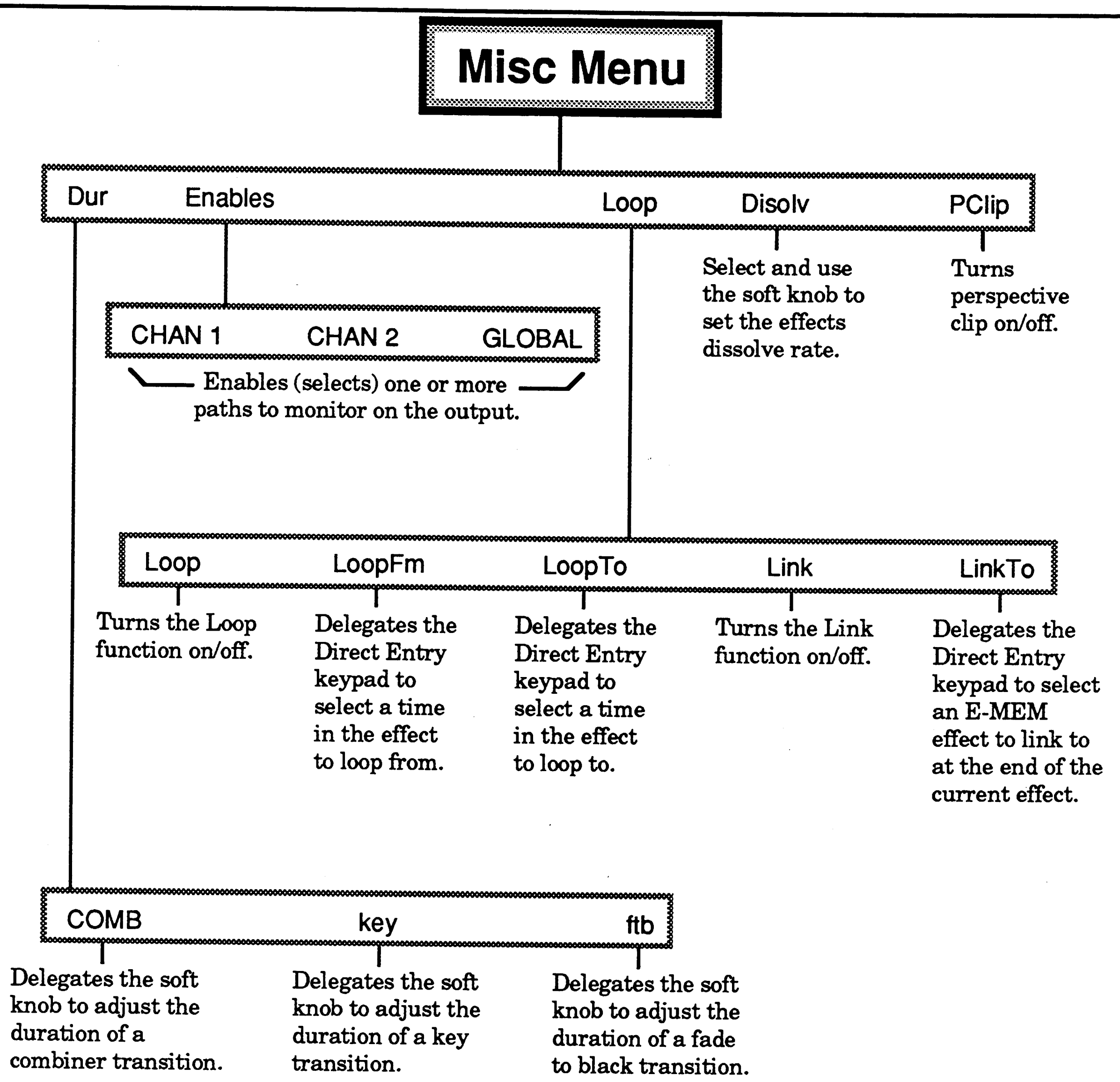
Ext / MATTE: Select either the external background input or a solid matte color generated by the DPM as the PROGRAM output background.

SHAPED: Press to turn key shaping on/off.

LUMA: Select and use the soft knob to adjust the brightness of the matte background color.

Sat: Select and use the soft knob to adjust the amount of chroma in the matte background color.

Hue: Select and use the soft knob to adjust the shade of the matte background color


Misc Menu
Dur
Enables
Loop
Disolv
PClip
CHAN 1
CHAN 2
GLOBAL
Loop
LoopFm
LoopTo
Link
LinkTo
COMB
key
ftb

Disolv: Select and use the soft knob to set the effects dissolve rate.

PClip: Turns perspective clip on/off.

CHAN 1, CHAN 2, GLOBAL: Enables (selects) one or more paths to monitor on the output.

Loop: Turns the Loop function on/off.

LoopFm: Delegates the Direct Entry keypad to select a time in the effect to loop from.

LoopTo: Delegates the Direct Entry keypad to select a time in the effect to loop to.

Link: Turns the Link function on/off.

LinkTo: Delegates the Direct Entry keypad to select an E-MEM effect to link to at the end of the current effect.

COMB: Delegates the soft knob to adjust the duration of a combiner transition.

key: Delegates the soft knob to adjust the duration of a key transition.

ftb: Delegates the soft knob to adjust the duration of a fade to black transition.

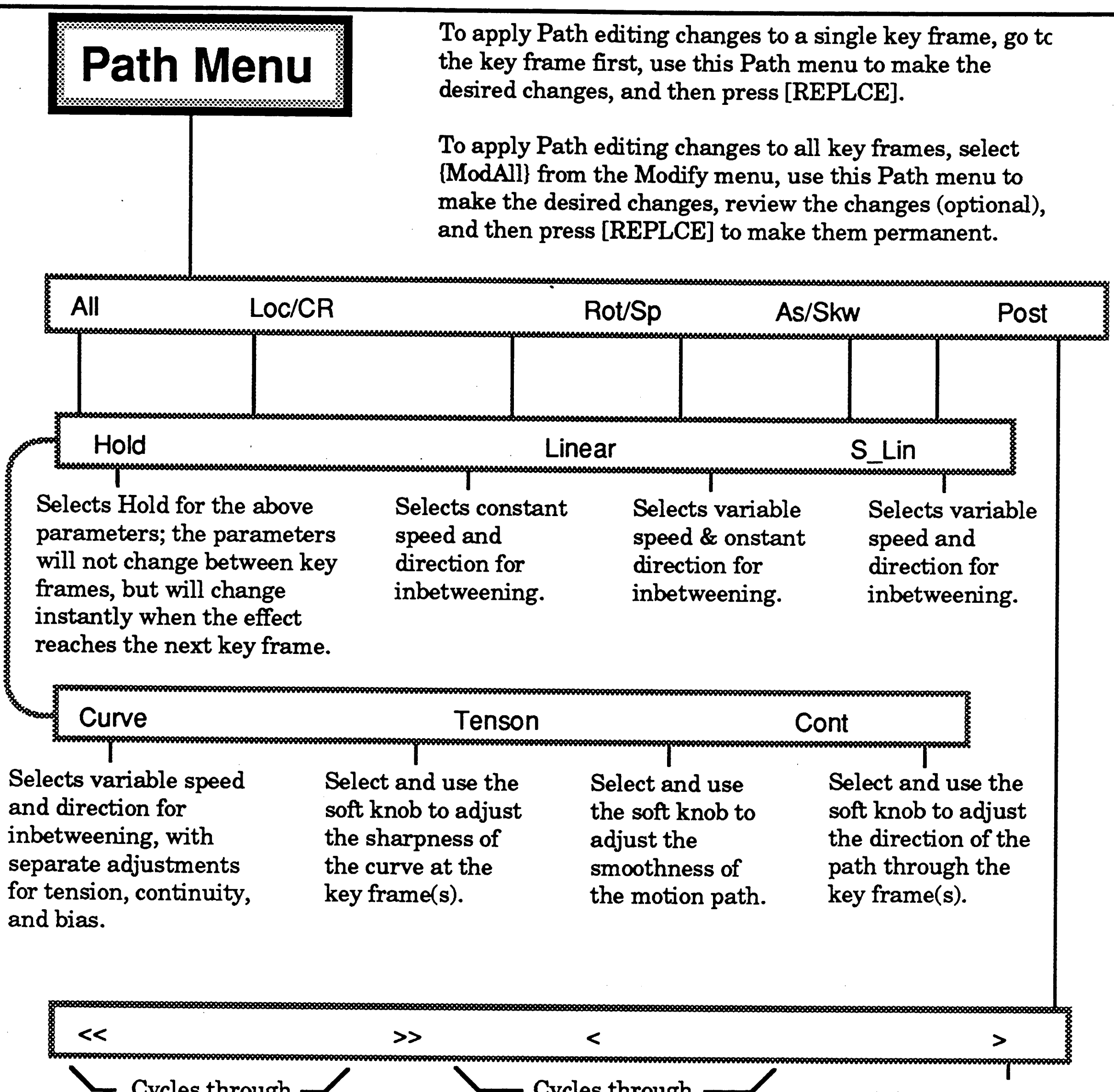
Modify Menu

ModAll	Cp1to2	Cp2to1	Kf1to2	Kf2to1	Save
Select and use the control panel to change all key frames.	Copies Ch 1's current effect to Channel 2.	Copies Ch 2's current effect to Channel 1.	Copies the Ch 1 working key frame to Channel 2.	Copies the Ch 2 working key frame to Channel 1.	Press to save the working key frame in a buffer; press [RESTOR WORKNG KF] to restore it.

Path Menu

To apply Path editing changes to a single key frame, go tc the key frame first, use this Path menu to make the desired changes, and then press [REPLCE].

To apply Path editing changes to all key frames, select {ModAll} from the Modify menu, use this Path menu to make the desired changes, review the changes (optional), and then press [REPLCE] to make them permanent.



Hold: Selects Hold for the above parameters; the parameters will not change between key frames, but will change instantly when the effect reaches the next key frame.

Linear: Selects constant speed and direction for inbetweening.

Selects variable speed & onstant direction for inbetweening.

S_Lin: Selects variable speed and direction for inbetweening.

Curve: Selects variable speed and direction for inbetweening, with separate adjustments for tension, continuity, and bias.

Tenson: Select and use the soft knob to adjust the sharpness of the curve at the key frame(s).

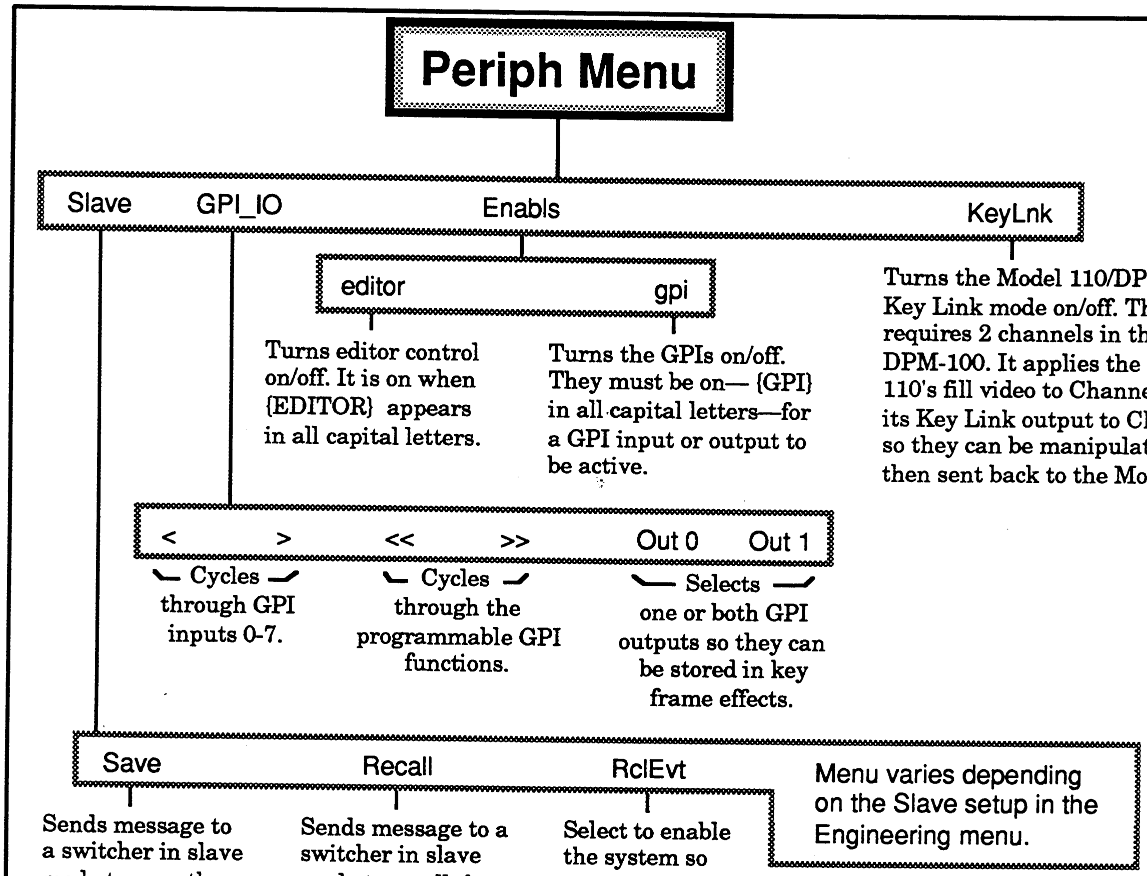
Select and use the soft knob to adjust the smoothness of the motion path.

Cont: Select and use the soft knob to adjust the direction of the path through the key frame(s).

<< >>: Cycles through the following additional parameter selections for Holds: Pict, Keyer, Border, Crop, Sfx, Matte Lvl, Recursive.

< >: Cycles through the various possible effects for the additional parameter selections for Holds.

Selects Hold for the parameters to the left; the parameters will not change between key frames, but will change instantly when the effect reaches the next key frame.



Turns editor control on/off. It is on when {EDITOR} appears in all capital letters.

Turns the GPIs on/off. They must be on— {GPI} in all capital letters—for a GPI input or output to be active.

Turns the Model 110/DPM-100 Key Link mode on/off. This mode requires 2 channels in the DPM-100. It applies the Model 110's fill video to Channel 1 and its Key Link output to Channel 2 so they can be manipulated and then sent back to the Model 110.

Cycles through GPI inputs 0-7.

Cycles through the programmable GPI functions.

Selects one or both GPI outputs so they can be stored in key frame effects.

Sends message to a switcher in slave mode to save the selected register (shown in the display as Reg: ##). Use the keypad to select the register number.

Sends message to a switcher in slave mode to recall the selected register (shown in the display as Reg: ##). Use the keypad to select the register number.

Select to enable the system so you can store a recall register command in the working key frame.

Menu varies depending on the Slave setup in the Engineering menu.

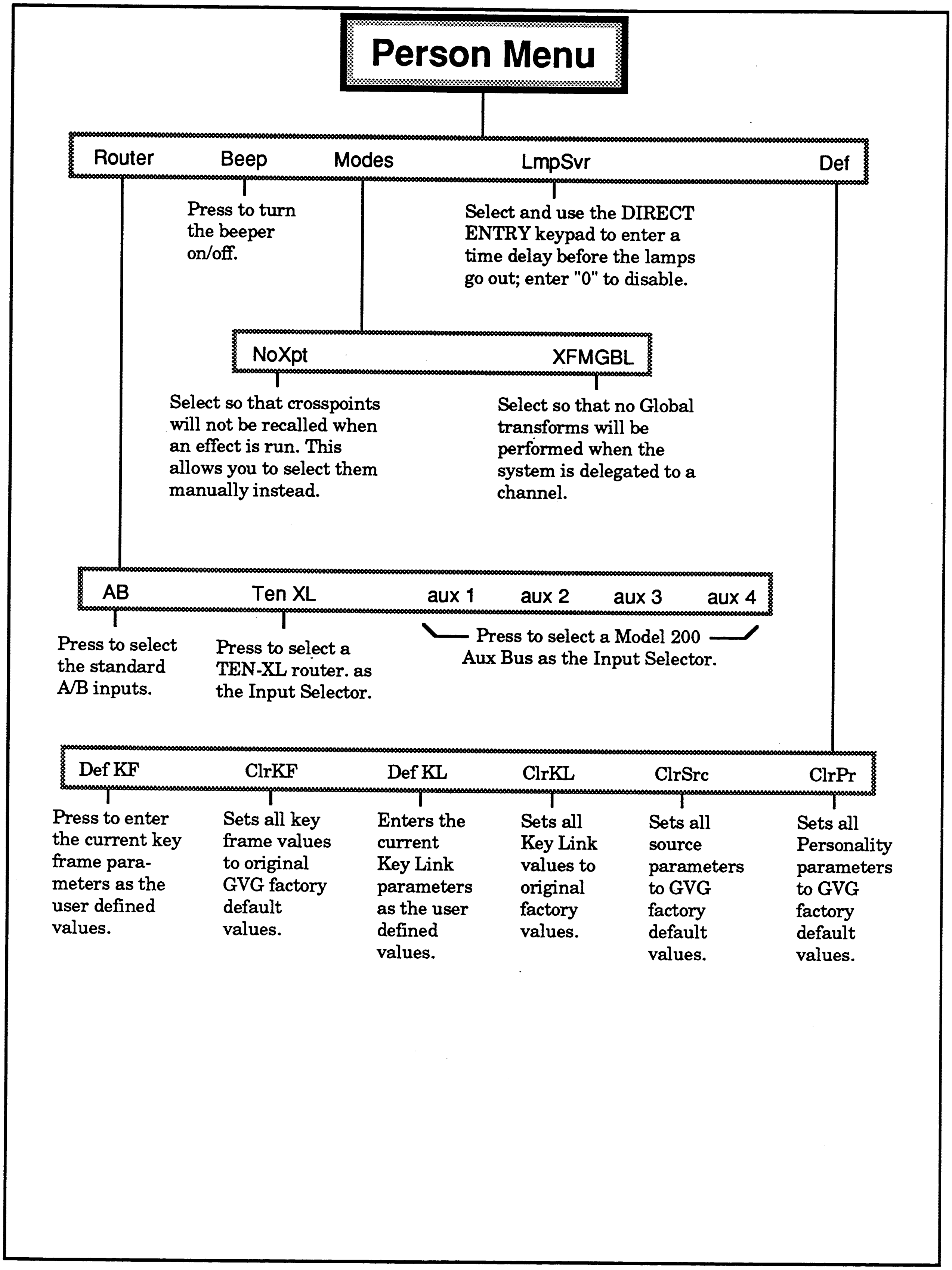
Turns the switcher's corresponding event toggle and tally on/off. See the Table below.

Table of Switcher Events

MODEL 100/110: prgcut prg_at dskcut dsk_at ftb

MODEL 200-1: prgcut prg_at me1cut me1_at dskcut dsk_at ftb

MODEL 200-2: dskcut dsk_at me1cut me1_at me2cut me2_at ftb


Person Menu
Router
Beep
Modes
LmpSvr
Def
NoXpt
XFMGBL
AB
Ten XL
aux 1
aux 2
aux 3
aux 4
Def KF
ClrKF
Def KL
ClrKL
ClrSrc
ClrPr

Beep: Press to turn the beeper on/off.

LmpSvr: Select and use the DIRECT ENTRY keypad to enter a time delay before the lamps go out; enter "0" to disable.

NoXpt: Select so that crosspoints will not be recalled when an effect is run. This allows you to select them manually instead.

XFMGBL: Select so that no Global transforms will be performed when the system is delegated to a channel.

AB: Press to select the standard A/B inputs.

Ten XL: Press to select a TEN-XL router. as the Input Selector.

aux 1 – aux 4: Press to select a Model 200 Aux Bus as the Input Selector.

Def KF: Press to enter the current key frame parameters as the user defined values.

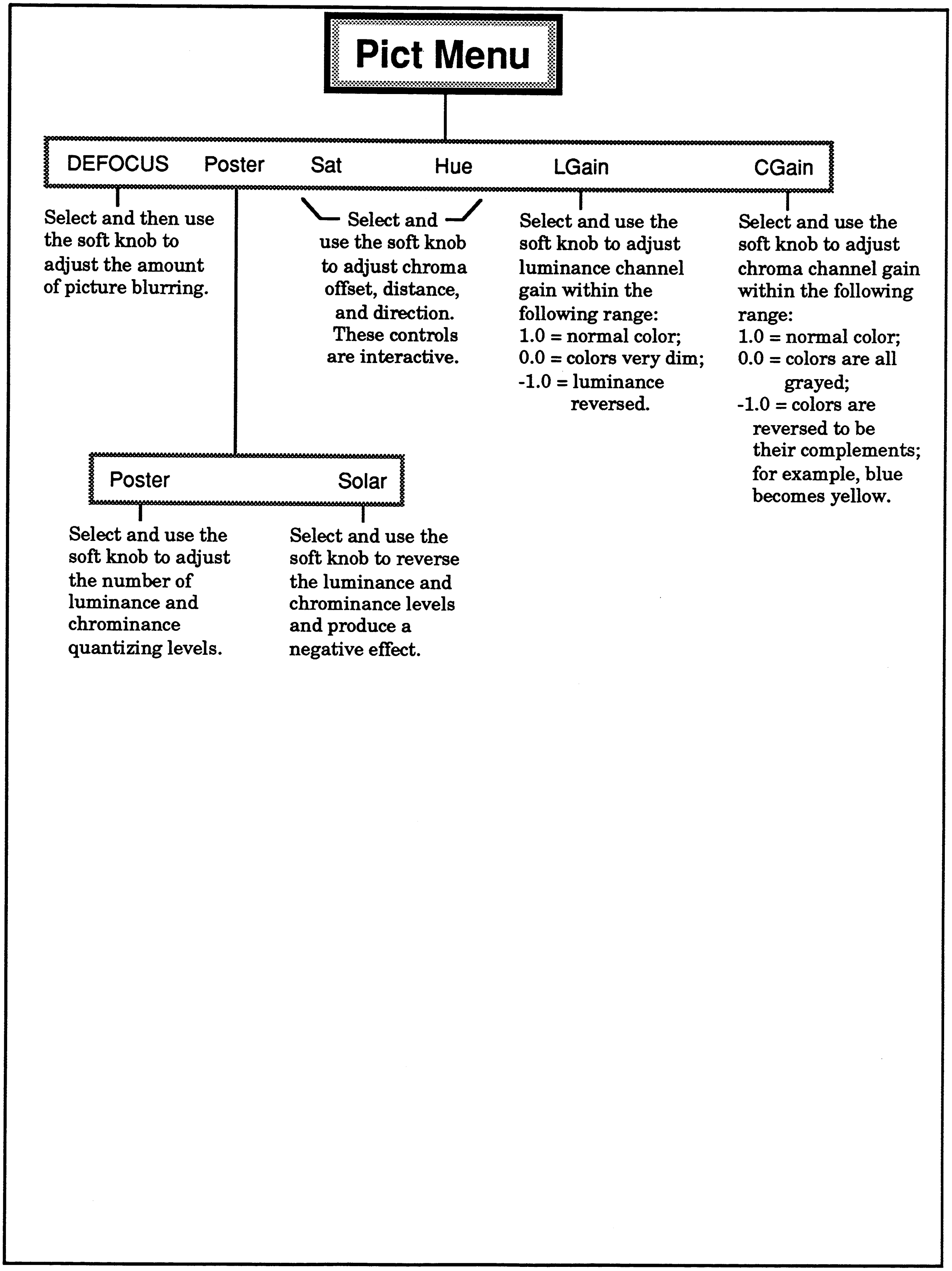
ClrKF: Sets all key frame values to original GVG factory default values.

Def KL: Enters the current Key Link parameters as the user defined values.

ClrKL: Sets all Key Link values to original factory values.

ClrSrc: Sets all source parameters to GVG factory default values.

ClrPr: Sets all Personality parameters to GVG factory default values.



DEFOCUS: Select and then use the soft knob to adjust the amount of picture blurring.

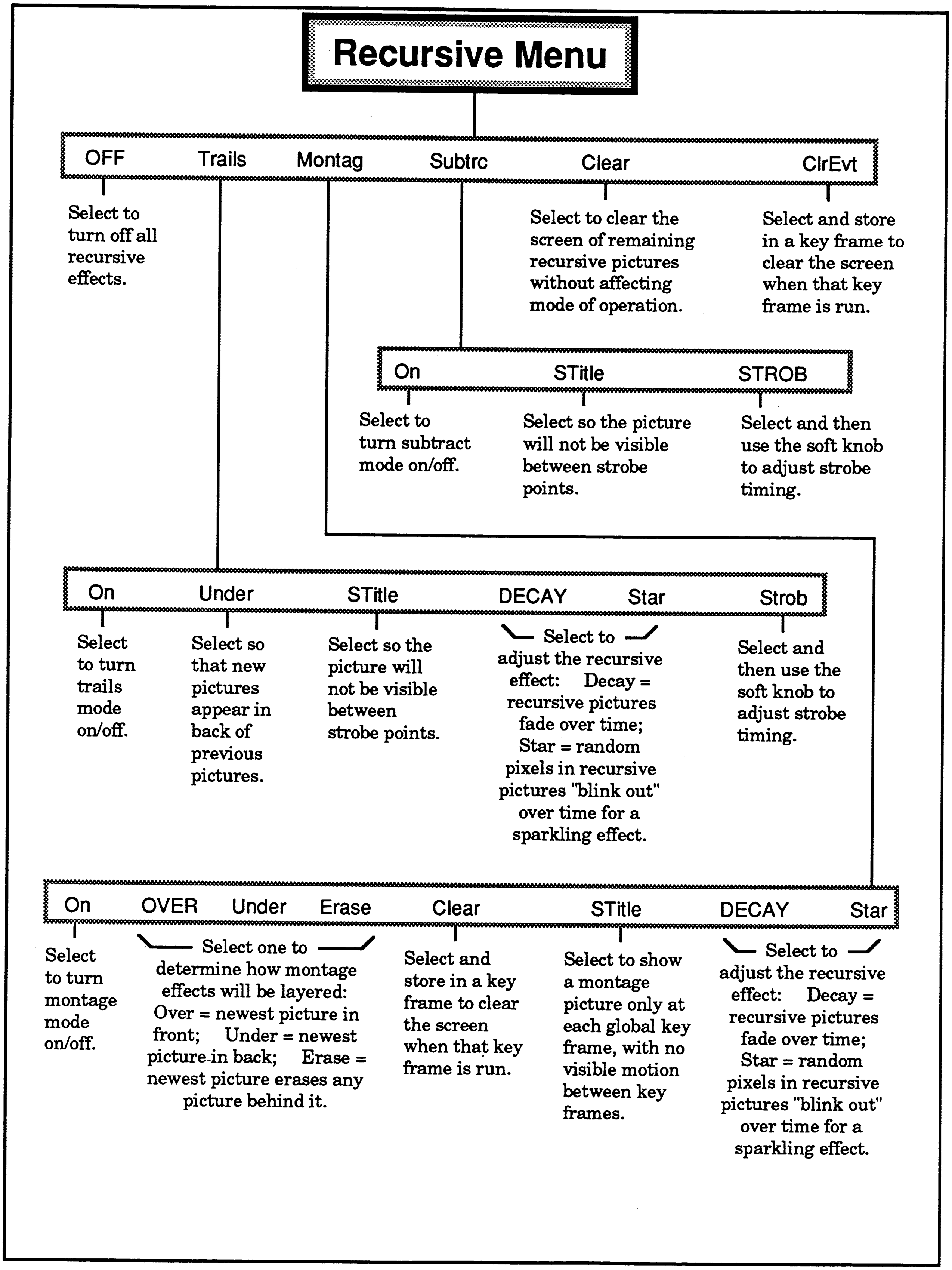
Sat / **Hue:** Select and use the soft knob to adjust chroma offset, distance, and direction. These controls are interactive.

LGain: Select and use the soft knob to adjust luminance channel gain within the following range:
1.0 = normal color;
0.0 = colors very dim;
-1.0 = luminance reversed.

CGain: Select and use the soft knob to adjust chroma channel gain within the following range:
1.0 = normal color;
0.0 = colors are all grayed;
-1.0 = colors are reversed to be their complements; for example, blue becomes yellow.

Poster → **Poster:** Select and use the soft knob to adjust the number of luminance and chrominance quantizing levels.

Poster → **Solar:** Select and use the soft knob to reverse the luminance and chrominance levels and produce a negative effect.



OFF: Select to turn off all recursive effects.

Clear: Select to clear the screen of remaining recursive pictures without affecting mode of operation.

ClrEvt: Select and store in a key frame to clear the screen when that key frame is run.

On: Select to turn subtract mode on/off.

STitle: Select so the picture will not be visible between strobe points.

STROB: Select and then use the soft knob to adjust strobe timing.

On: Select to turn trails mode on/off.

Under: Select so that new pictures appear in back of previous pictures.

STitle: Select so the picture will not be visible between strobe points.

DECAY, **Star**: Select to adjust the recursive effect: Decay = recursive pictures fade over time; Star = random pixels in recursive pictures "blink out" over time for a sparkling effect.

Strob: Select and then use the soft knob to adjust strobe timing.

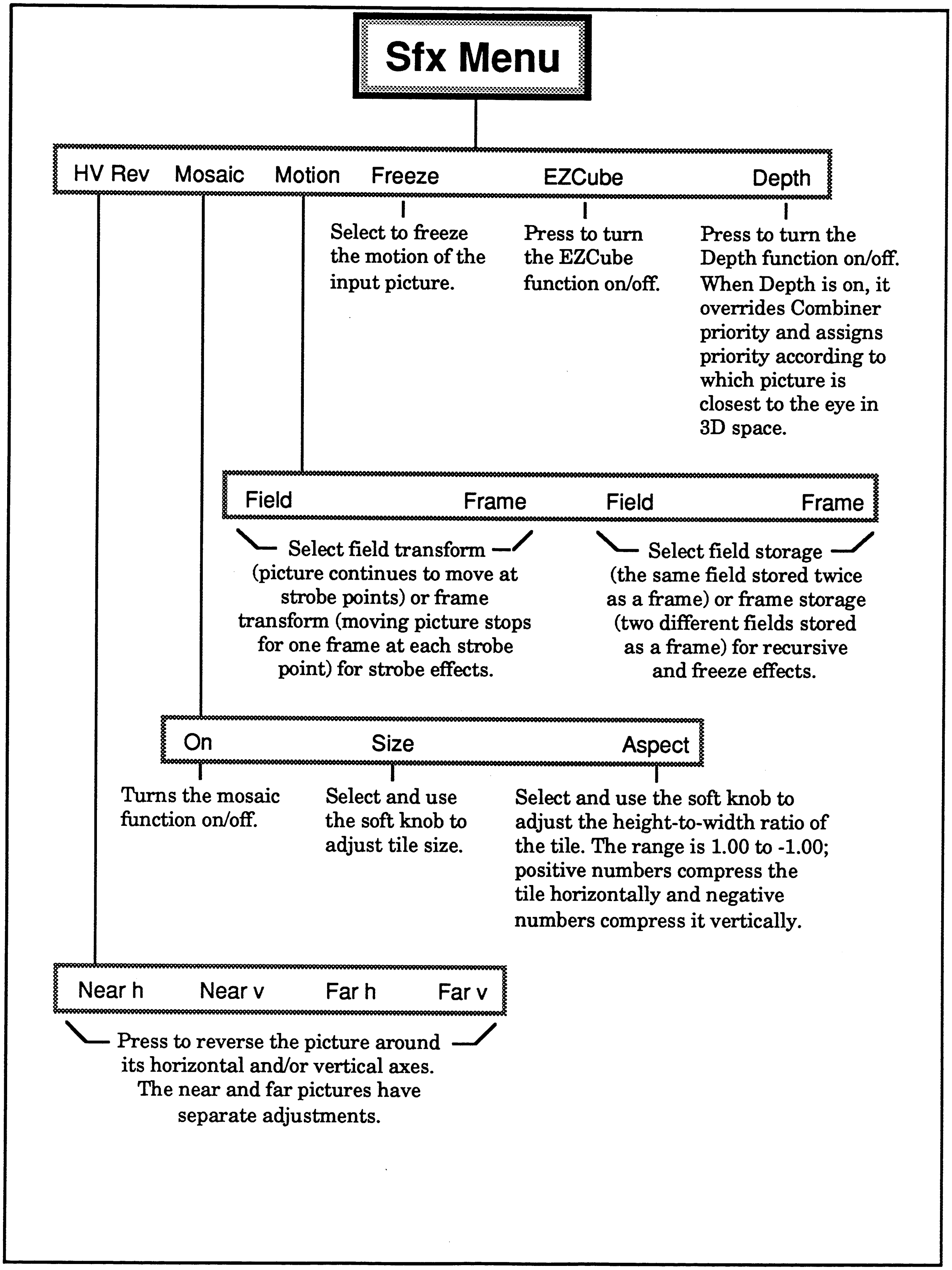
On: Select to turn montage mode on/off.

OVER, **Under**, **Erase**: Select one to determine how montage effects will be layered: Over = newest picture in front; Under = newest picture in back; Erase = newest picture erases any picture behind it.

Clear: Select and store in a key frame to clear the screen when that key frame is run.

STitle: Select to show a montage picture only at each global key frame, with no visible motion between key frames.

DECAY, **Star**: Select to adjust the recursive effect: Decay = recursive pictures fade over time; Star = random pixels in recursive pictures "blink out" over time for a sparkling effect.


Sfx Menu
HV Rev
Mosaic
Motion
Freeze
EZCube
Depth
Field
Frame
Field
Frame
On
Size
Aspect
Near h
Near v
Far h
Far v

Select to freeze the motion of the input picture.

Press to turn the EZCube function on/off.

Press to turn the Depth function on/off. When Depth is on, it overrides Combiner priority and assigns priority according to which picture is closest to the eye in 3D space.

Select field transform (picture continues to move at strobe points) or frame transform (moving picture stops for one frame at each strobe point) for strobe effects.

Select field storage (the same field stored twice as a frame) or frame storage (two different fields stored as a frame) for recursive and freeze effects.

Turns the mosaic function on/off.

Select and use the soft knob to adjust tile size.

Select and use the soft knob to adjust the height-to-width ratio of the tile. The range is 1.00 to -1.00; positive numbers compress the tile horizontally and negative numbers compress it vertically.

Press to reverse the picture around its horizontal and/or vertical axes. The near and far pictures have separate adjustments.

Term Menu

The Terminal Menu is used to control the optional TTY terminal display. The displays show parameters for most of the STREAMLINE menus and for some other functions.

Pict	Displays the Picture parameters.
Trans	Displays the Transform parameters.
Misc	Displays the KeyLayer and Miscellaneous parameters.
Tline	Displays the current effect on a Time Line.
zoom	Delegates the soft knob to the zoom function for the Time Line display.
Auto	Turns on/off the automatic ? function.
Border	Displays the Border parameters.
Path	Displays the Path parameters.
Periph	Displays the Personality & Peripheral parameters
Std	Delegates the Video Standard parameters.
Editor	Displays the Serial interface parameters.
Eng	Displays the Engineering parameters.

Section 4
Functional Description

INTRODUCTION

This section describes the functioning of the DPM-700's circuitry on two levels of detail:

- Overview of Subsystems: A brief introduction to the four subsystems, based on the System Block Diagram
- Detailed Functional Description:

  Video/Key Subsystem
    Interface Module (Video Input Section)
    Digital Video Processor Module
    Control Processor Module (Video/Key Section)
    Interface Module (Video Output Section)

  Control Subsystem
    Control Processor Module (Control Section)
    Control Panel

  Timing (Pulse Regeneration) Subsystem
    Interface Module —Timing Section

  Power Supply and Power Distribution Subsystem
    Frame Power Supply
    Interface Module Power Regulator
    Control Panel Power Regulators

OVERVIEW OF SUBSYSTEMS

This overview refers to Figure 4-1, the System Block Diagram, found on the following pages.

The DPM-700 system consists of four subsystems of circuitry: (1) video and key signal processing, (2) control, (3) timing [pulse regeneration], and (4) power. These subsystems physically span two main assemblies: the electronics frame and control panel. The frame has a maximum of four main modules, a maximum of four submodules that mount on top of the main modules, and a power supply (with two fans). The bottom-right corner of Figure 4-1 shows the control panel, which connects to the frame via a single power/control cable. The panel contains four printed circuit board assemblies plus a disk drive. The frame modules and submodules and the panel circuit boards are listed below:

Electronics Frame

1. Interface Module
    - Input Submodule for Channel 1
    - Input Submodule for Channel 2 (optional)
2. Digital Video Processor Module—Channel 1
3. Digital Video Proc. Mod.—Chan. 2 (optional)
4. Control Processor Module
    - Combiner Submodule (optional)
    - Recursive Memory (optional)

Control Panel (assemblies not shown on diagram)

1. Control Processor Board Assembly
2. Switch Board Assembly
3. E-MEM® Board Assembly
4. STREAMLINE™ Fluorescent Display Board Assembly

Video/Key Subsystem

At the upper left corner of the diagram, Figure 4-1 shows the input signals for Channel 1 and Channel 2 arriving at the input submodules. Here they are buffered, crosspoint-selected, converted to digital form (if necessary), and decoded into separate Y (luminance) and C (chrominance) digital buses.

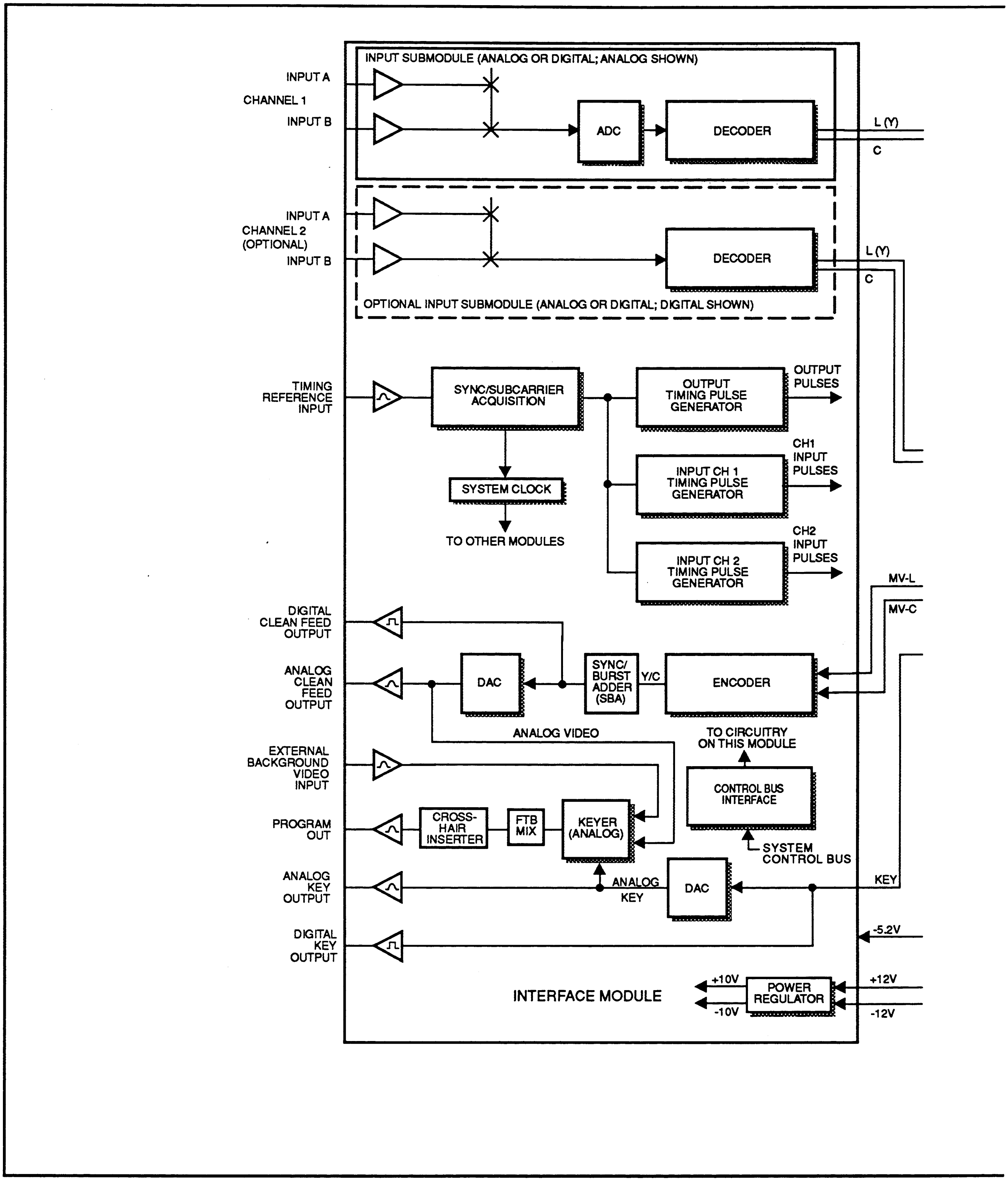
Each channel's signals pass through their respective Digital Video Processor Modules where they can be manipulated to receive such special effects as posterization, borders, and transforms (perspective, skew, sizing, spins, etc.). The signals then pass to the Control Processor Module on their Y and C buses.

A matching transformed key signal derived from control parameters for the transformed video originates on the Digital Video Processor Module. It runs via its own key bus to the Control Processor Module.

When the optional second channel is present, properly formatted key signals can be input to and manipulated by one of the two video manipulation channels. For example, this feature could be used with a character generator as a video/key source that produces a separate key signal used to "cut" key holes for its characters (video). In the DPM-700, this kind of key signal can be processed in-sync and in-parallel with its associated fill video (from the character generator). Or, it can be processed independently and filled by other manipulated video, for example, filling the shapes of letters with rolling video of a waterfall.

Digital manipulation continues on the Control Processor Module to achieve effects related to combining the images from the two manipulation channels (when 2nd Channel Option is installed), processing key signals for different types of keying, and blanking video outside the picture area. When the 2nd Channel Option is installed, the Combiner Submodule is the first stage of the Control Processor Module. If not, the Standard Channel-1 Key Processor and Video Shaper Circuitry is the first stage.

Another option, the Recursive Memory Submodule, processes the video and key signals to produce such recursive effects as montage, trails, decay trails, star trails, strobe, etc. Finally, behind the manipulated video image area can be added a background matte of user-determined hue, saturation, and luminance. The background matte is only visible if the manipulated video image areas have been reduced in size, faded, cropped, or otherwise manipulated upstream.


INPUT SUBMODULE (ANALOG OR DIGITAL; ANALOG SHOWN)
INPUT A
CHANNEL 1
INPUT B
ADC
DECODER
L (Y)
C
INPUT A
CHANNEL 2
(OPTIONAL)
INPUT B
DECODER
L (Y)
C
OPTIONAL INPUT SUBMODULE (ANALOG OR DIGITAL; DIGITAL SHOWN)
TIMING
REFERENCE
INPUT
SYNC/SUBCARRIER ACQUISITION
OUTPUT TIMING PULSE GENERATOR
OUTPUT PULSES
SYSTEM CLOCK
TO OTHER MODULES
INPUT CH 1 TIMING PULSE GENERATOR
CH1 INPUT PULSES
INPUT CH 2 TIMING PULSE GENERATOR
CH2 INPUT PULSES
MV-L
MV-C
DIGITAL CLEAN FEED OUTPUT
ANALOG CLEAN FEED OUTPUT
DAC
SYNC/ BURST ADDER (SBA)
Y/C
ENCODER
ANALOG VIDEO
TO CIRCUITRY ON THIS MODULE
EXTERNAL BACKGROUND VIDEO INPUT
CONTROL BUS INTERFACE
PROGRAM OUT
CROSS-HAIR INSERTER
FTB MIX
KEYER (ANALOG)
SYSTEM CONTROL BUS
ANALOG KEY OUTPUT
ANALOG KEY
DAC
KEY
DIGITAL KEY OUTPUT
-5.2V
+10V
-10V
POWER REGULATOR
+12V
-12V
INTERFACE MODULE

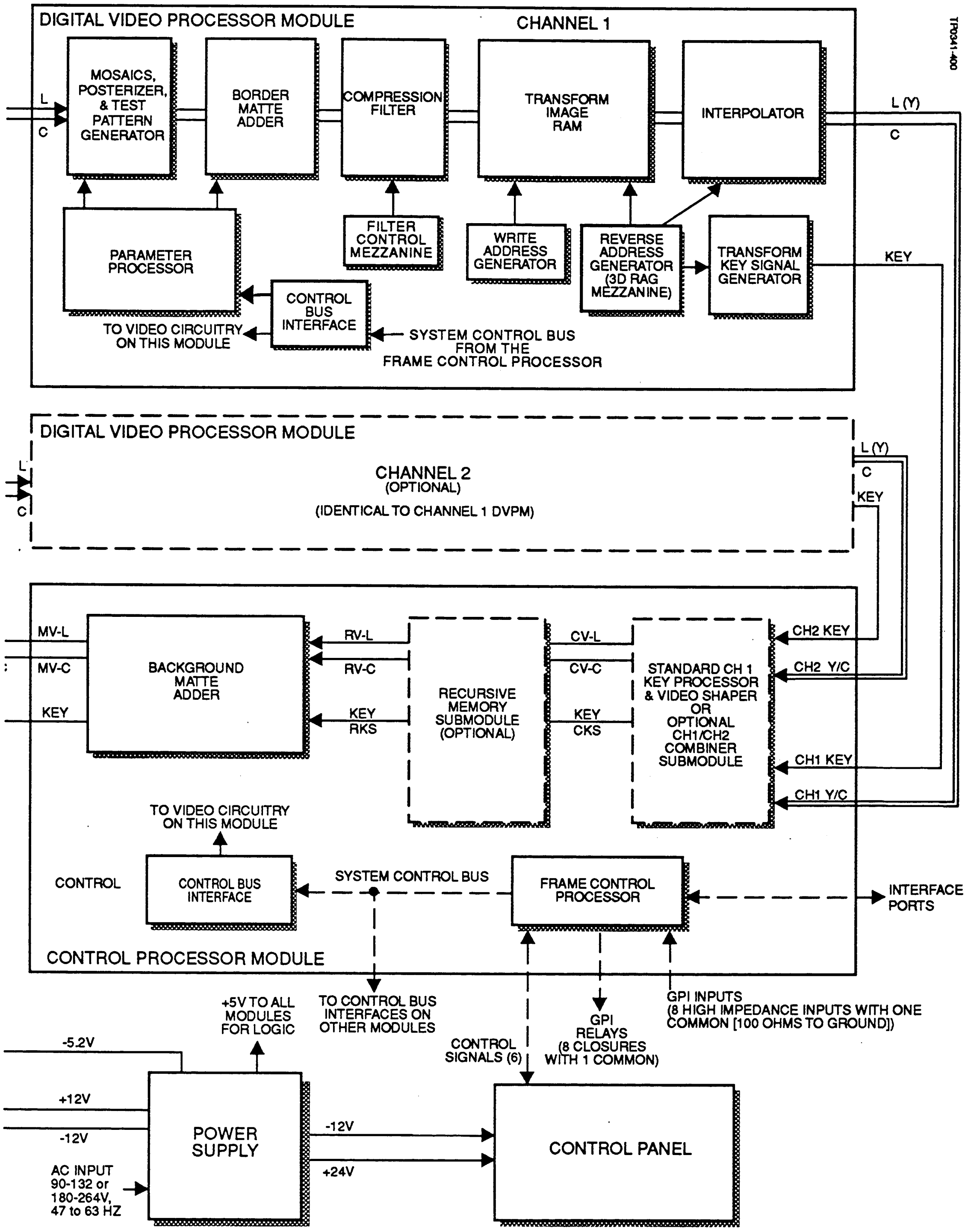

DIGITAL VIDEO PROCESSOR MODULE
CHANNEL 1
TP0341-400
L
C
MOSAICS, POSTERIZER, & TEST PATTERN GENERATOR
BORDER MATTE ADDER
COMPRESSION FILTER
TRANSFORM IMAGE RAM
INTERPOLATOR
L (Y)
C
PARAMETER PROCESSOR
FILTER CONTROL MEZZANINE
WRITE ADDRESS GENERATOR
REVERSE ADDRESS GENERATOR (3D RAG MEZZANINE)
TRANSFORM KEY SIGNAL GENERATOR
KEY
CONTROL BUS INTERFACE
TO VIDEO CIRCUITRY ON THIS MODULE
SYSTEM CONTROL BUS FROM THE FRAME CONTROL PROCESSOR
DIGITAL VIDEO PROCESSOR MODULE
CHANNEL 2
(OPTIONAL)
(IDENTICAL TO CHANNEL 1 DVPM)
L
C
L (Y)
C
KEY
MV-L
MV-C
KEY
BACKGROUND MATTE ADDER
RV-L
RV-C
KEY
RKS
RECURSIVE MEMORY SUBMODULE (OPTIONAL)
CV-L
CV-C
KEY
CKS
STANDARD CH 1 KEY PROCESSOR & VIDEO SHAPER OR OPTIONAL CH1/CH2 COMBINER SUBMODULE
CH2 KEY
CH2 Y/C
CH1 KEY
CH1 Y/C
TO VIDEO CIRCUITRY ON THIS MODULE
CONTROL
CONTROL BUS INTERFACE
SYSTEM CONTROL BUS
FRAME CONTROL PROCESSOR
INTERFACE PORTS
CONTROL PROCESSOR MODULE
+5V TO ALL MODULES FOR LOGIC
TO CONTROL BUS INTERFACES ON OTHER MODULES
CONTROL SIGNALS (6)
GPI RELAYS (8 CLOSURES WITH 1 COMMON)
GPI INPUTS (8 HIGH IMPEDANCE INPUTS WITH ONE COMMON [100 OHMS TO GROUND])
-5.2V
+12V
-12V
AC INPUT 90-132 or 180-264V, 47 to 63 HZ
POWER SUPPLY
-12V
+24V
CONTROL PANEL

Figure 4-1. DPM-700 System Block Diagram

The three buses (Y, C, and KEY) leave the Control Processor Module and return to the Interface Module where the video Y and C buses can be processed for output in a variety of ways. Output processing includes PAL or NTSC encoding, conversion to analog form, and final buffering for driving output signals at the connectors on the backplane. Digital and Analog Clean Feed outputs consist only of the encoded, manipulated video. This can be shaped video over background matte or unshaped video (selected in the display menu). Downstream keying, fade-to-black, and crosshair insertion are available on the Program output. All outputs (video and key signals, both analog and digital) are active in all systems.

Control Subsystem

Microprocessor control within the DPM-700 affects all the video and key signal processing hardware. Figure 4-1 shows the two main elements of the control subsystem:

- Control Panel
- Frame Control Processor

The latter is a block on the Control Processor Module consisting of two microprocessors (CPUs)— one for communications with the panel and various control ports, and the other for transformations and other video manipulations. The Transform CPU uses a math co-processor and governs the video manipulation data (parameters), addresses, and control pulses routed to all video and key signal hardware on each module via their respective control bus interfaces. The Control Panel contains a third CPU for communicating control changes to the frame, keeping panel controls polled and displays updated, driving the STREAMLINE™ display, and for handling data to and from the disk drive.

Timing Subsystem (Pulse Regeneration)

This subsystem begins with the Timing Reference Input (left side of Figure 4-1). The analog signal connected to this frame input provides a sync/subcarrier reference for the following timing signals:

- Output Timing Pulse
- Channel 1 Input Timing Pulse
- Channel 2 Input Timing Pulse
- System Clock (17.73 MHz for PAL systems and 14.3 MHz for NTSC)

With the innovative UPSTREAM/DOWNSTREAM™ timing feature of the DPM-700, three separate timing subsystems exist. The Output Timing Pulse Generator allows timing adjustment of the video and key outputs, while the Input Timing Pulse Generators time the input circuitry on their respective input submodules. Adjustable timing for each video input allows signals not timed at the point of input to the DPM-700 to be timed *inside* the DPM-700, before manipulation.

Power Subsystem

The DPM-700 frame contains the single power supply for the entire system. Two fans cool the supply, drawing outside air through a filter and exhausting it through vents on the right side of the frame. The ac input line voltage is selectable within specified ranges, and the line is fused. The power supply has an on/off switch, and all five outputs are dc, some of which are also fused:

- +5 Vdc to all modules for logic
- -5.2 Vdc to the Interface Module for data conversion components
- -12 Vdc to the Control Panel for its ADC reference and to the Interface Module's power regulator to be converted to -10 Vdc for the module's analog circuitry
- +12 Vdc to the Interface Module's Power Regulator to be converted to +10 Vdc for the module's analog circuitry
- +24 Vdc goes only to the Control Panel where it is converted by three separate power regulators:
  - +5 Vdc for the panel's CPU
  - +5Vdc for panel lamps and the Flash EEPROM relay
  - +12Vdc for operating the disk drive and erasing the Flash EEPROM when needed.

DETAILED FUNCTIONAL DESCRIPTION

This description is intended to provide you with the information you need to understand the the primary functions of each module and submodule. Some of the information deals with more detailed functional blocks to give you a better grasp of module functions. Those descriptions coincide with module and sub-module block diagrams located in the Drawings Section of this manual. You can find a table of drawings at the beginning of that section that lists the drawing sets by module part number and by name. For quick reference, you will find tab dividers with module names throughout the drawings section.

Video/Key Subsystem

The Video/Key Subsystem consists of circuitry located on the Input Submodules, the Digital Video Processor Modules, the Control Processor Module, and the optional Recursive Memory Submodule.

The Input Submodules

This submodule's description refers to the submodule block diagrams located in the Drawings Section.
All DPM-700 systems come with a single channel (Channel 1) as standard equipment. A second channel can be added as an option. Figure 4-1 shows that each video channel has two main parts: an Input Submodule, mounted on the Interface Module, and a Digital Video Processor Module.

Input Submodules are available in either analog or digital format for both channels. The format you select for one channel has no effect on the other channel. You can use one input format for Channel 1 and use the same, or a different format, for Channel 2.

The input connectors on the backplane of the electronics frame feed signals to the Input Submodule(s). The way the signals are processed from that point depends on whether the submodule is for analog or digital format.

Analog Input Submodule: Video entering an Analog Input Submodule first enters a buffer, which isolates the load on the input. The signal next passes through a clamp that places sync tip at ground potential for hum rejection. From there, the signal passes on to the crosspoint switching matrix where either input 'A' or input 'B' is selected for the given channel. Once selected, the signal is low-pass filtered for anti-aliasing and then phase-corrected for group delay.

Next, in preparation for analog to digital conversion, the signal passes through an inverting amplifier with a backporch feedback clamp that keeps blanking at the proper DC level to offset any drifts that may have occurred. Then, it goes to the analog-to-digital converter (ADC).

The ADC samples the analog signal at 17.73 MHz in PAL systems and at 14.3 MHz for NTSC systems. For each sample point, the ADC produces one byte (8 bits) of digital video data. This means that a sample is taken approximately every 56 nanoseconds for PAL and approximately every 70 nanoseconds for NTSC. The phase of the system clock is shifted so that the sampling always takes place on the burst reference axis for each given input. Adjusting this phase shift is part of the installation procedure for each input device. The phase shift value for each input is stored until called upon by the user. The signal produced by this circuitry will be in composite digital (D2) format.

Digital Input Submodule: Video entering a Digital Input Submodule follows a simpler path. The signal first enters a line receiver and then a buffer where it is converted from ECL to TTL. Next, either the 'A' or 'B' input is selected by a digital crosspoint or multiplexer.

For both Analog and Digital Input Submodules, the signal is next delayed one field so that the overall delay through the DPM-700 system is two fields instead of one field. This is done to maintain the correct interlace relationship between adjacent fields of video. The delayed signal enters the last major stage on both analog and digital submodules, the Decoder, which splits the composite digital signal into two separate digital signals: L (luminance) and C (chrominance). Thereafter, 'L' and 'C' each travel on their own separate 8-bit buses. Lastly, the 'L' and 'C' output buses are retimed to the system clock and sent to the Digital Video Processor Module via the interior motherboard.

The Digital Video Processor Module

Refer to Figure 4-1 for the following descriptions. Channel 1 and Channel 2 use separate but identical Digital Video Processor Modules. The 'L' and 'C' signals are first delayed to remain in-sync with the system clock which is buffered as it arrives on this module.

Test-Pattern Generator/Mosaics/Posterizer: Internally generated test patterns are available for system troubleshooting. You select the test pattern under the engineering {Eng} menu of the STREAMLINE™ display. If a problem occurs with standard video input, but not with the test patterns, the fault probably exists with the input device or with the input submodule.

Based upon control data from the operator's controls, via the Parameter Processor (or Video Input Controller), the Mosaic circuitry samples the signal and holds the same information for a given number of horizontal pixels. Then the line repeats for a given number of lines, according to the size and aspect determined by the operator.

Mosaics can be transformed, or manipulated, and can be duplicated with the optional Recursive Memory, since these functions are downstream from the Mosaic circuitry. It is important to note the order of functional blocks in the video path, to determine how different DPM-700 effects can be combined (see Figure 4-1).

The Posterizer also receives its information from the Parameter Processor. The Posterizer (and Solarizer) changes the luminance and chrominance values of the video (and external key signals, where applicable). The circuit is commonly used to reduce the number of grey-scale levels or colors, producing super-contrasted images. It uses RAM-based look-up tables (LUTs) that are alterable on a field-by-field basis. Separate LUTs are used for luminance and chrominance. The values stored in each table depend upon user control input. Each look-up table uses each incoming signal byte as an address to a new value stored in the table which is then output in place of the incoming value.

Border Matte Adder (Image Cropper): This circuitry is essentially a keyer capable of adding an internal rectangular border matte around all four sides of the input video image area. The width of the four sides can be adjusted independently. Border color, independent edge sharpness, and corner sharpness are dynamically controlled by the user.

There are three important functional areas in the Border Matte Adder: the Border Key Generator, the Border Matte Generators, and the Border Mixers. There is just one Border Key Generator which serves both the chrominance and luminance buses, whereas there are two Border Matte Generators and two Border Mixers—one each for the chrominance bus and the luminance bus.

The border key generator actually consists of separate horizontal and vertical elements which produce a single, combined key signal. This key signal is sent to both mixers. The horizontal element of the key signal is read from a RAM-based look-up table that converts the distance from the left edge of the picture to a key level. The vertical element is calculated line-by-line by the Parameter Processor under user control. The horizontal and the vertical matte key signals can be combined in two ways, determined by the user—either by multiplying, which produces more rounded, or faceted corners, or by non-additive mixing, which produces square corners.

The chrominance and luminance Border Matte Generators are also controlled by parameters from the user via the Parameter Processor. The user can specify the color (hue and saturation) and the luminance of the border matte. The outputs of the matte generators are sent to their respective Border Mixers to be mixed with primary video.

The Border Mixers are standard video mixers much like those used throughout the DPM-700. The inputs are the primary video (X) from the Posterizer block, the matte video (Y), and the border key signal (Z). The mixer operates using the formula: $\{X \cdot Z\} + \{Y \cdot (1-Z)\}$, so that as the key signal level increases or decreases, the proportions of primary video and border video in the mix changes. More key signal produces more border and less primary video, and less key signal produces less border and more primary video at the output.

Anti-aliasing Compression Filter: If the user calls for any compression or rotation of the video image, undesirable aliasing effects can occur because some of the input pixels (digital samples) must be omitted in the Transformation Subsystem which immediately follows. Aliasing causes moire patterns and jagged edges. These filters compensate for this problem by effectually blurring (or defocussing) the image. This is accomplished by producing an average for each pixel, based on the weighted values of its neighbors; nine horizontal and nine vertical neighbors are considered in each averaging. The weighting of the neighboring pixels varies according to the amount of compression and the angle of rotation.

Filter Control Mezzanine: With 3D effects, the compression of pixels can vary across the video picture. The Filter Control Mezzanine selects filter weighting according to the compression of each pixel. The weighting information is used by the compression filter to perform anti-aliasing.

The Transformation Subsystem: This subsystem consists of these five major blocks shown on the System Block Diagram:

- TRANSFORM IMAGE RAM
- WRITE-ADDRESS GENERATOR
- REVERSE-ADDRESS GENERATOR
- INTERPOLATOR
- TRANSFORM-KEY-SIGNAL GENERATOR

These five major blocks work together to *transform* the primary video image(s) to produce the following special effects: compressions, perspective, skew, aspect ratio, rotation about the x, y, and z axes, and translation in the x, y, and z axes. These *transformations* result in any or all of the following changes to the original image: size, location, orientation, and viewpoint.

Functionally, as a set, these 5 blocks are always in the video path, even when no transformation is called for by the user; for no transformation, the blocks simply process the image field without changing it. Thus, the following process explanation applies for all cases. On the System Block Diagram, note that the Write-Address Generator, Reverse-Address Generator, and Transform Key Signal Generator are not directly in the video path, but do play major roles in the operation of the Transform Image RAM and the Interpolator for doing image transformations, as described below.

This subsystem makes the necessary changes in each field of video to accomplish the transformations the user is calling for. It does this by storing all the pixels of each field in standard video order and then by reading them out in some different order—either in part or total. It might be helpful to think of this subsystem as having a "before" picture/field and an "after" picture/field. The "before" field is like a picture puzzle made of many little pieces (pixels). It is the job of this subsystem to transform the "before" field by changing its make up in a variety of ways (depending on the special effect(s) desired). The result is the "after" picture/field. Other ways of thinking of the "before" and "after" fields are the input, original, starting, or source field; and the output, transformed, resulting, or target field.

Depending upon the special effect(s) desired, the transformation subsystem can use all or some of the "before" pixels "as is" for the pieces to the "after" field puzzle. In other cases, it must create (interpolate) new pixels, *based on* the "before" pixels. Imagine, for example, that the user starts with an image of a big tree, which originally fills the entire screen top-to-bottom, and then the user sets the controls for a 50% compression (reduction). The "after" puzzle is a tree half the original size. To construct the half-size tree, not all of the pixels of the original tree would be needed. How these transformations are accomplished is explained next. (Hereafter, we will refer to the "before" image field as the "source" field, and the "after" field as the "target" field.)

Transform Image RAM and Write-Address Generator (WAG): For any given field, the source pixels are received in standard field order and written into the memory cells of the Transform Image RAM as addressed by the Write-Address Generator. In essence, each incoming source field is "frozen" in memory, to be used as needed to construct the *transformed* image field. This type of system is known as *reverse transformation*, i.e., the transformation is accomplished not at the forward (input) end of the RAM, but just the reverse—at the output end.

The RAM addresses can be thought of as having coordinates that are always whole numbers (having no fractional component). That is to say, each address consists of 2 coordinates—X and Y—which are specified with numbers like 0, 1, 2, 3, 44, 157, 767, etc. The significance of the concept that whole numbers represent the write address locations will be explained in the Reverse-Address Generator description.

The Write Address Generator (WAG) places the pixels, in sequence, into four separate RAM groups (see Figure 4-2):

- X even/ Y even RAM (X'Y')
- X odd/ Y even RAM (X"Y')
- X even/ Y odd RAM (X'Y")
- X odd/ Y odd RAM (X"Y")

} ONE FIELD

Two banks of RAM make up a RAM group; one for luminance data and the other for chroma data. There is a total of eight banks of RAM per field of data, which we will call field RAM. There are two sets of field RAM. The WAG writes into one field RAM while the Reverse-Address Generator reads from the other. Therefore, the Transform Image RAM contains two sets of field RAM; Field A and Field B. As you can see from this process, the Transform Image RAM produces one field of delay. The Decoder on the Input

Submodule introduces another field of delay to provide a full frame of delay for the system, maintaining the correct interlace relationship between fields.

The process of placing data for four adjacent pixels into separate groups of RAM allows the data for four pixels to be accessed simultaneously. This is necessary to perform the interpolation process described later.

The pixels are designated as even and odd as they occur on a horizontal line and even and odd vertically, per line, as shown in Figure 4-2. As a video line is scanned, the WAG places the first pixel into the X even/Y even RAM, the second pixel into the X odd/Y even RAM, and so on. On the next line, the WAG places the first pixel into the X even/Y odd RAM, the second pixel into the X odd/Y odd RAM, and so on.

Reverse-Address Generator (RAG): Next (after the source field is frozen in memory), for each given field, it is necessary to find how much of each specified change needs to occur to achieve the desired effect(s). For example, how much compression, how much movement and in which directions, how much rotation, spin, perspective, etc. are needed? Control parameters derived from the user's input communicate these specifications to the Transformation Subsystem via the control system's microprocessor circuitry. These parameters are known technically as the *control coefficients of transformation*, and they tell the RAG how to generate the proper address which will access the desired pixel values (luminance and chrominance information) in RAM.

The user has virtually infinite choice as to where he positions objects in target space, and so the coefficients can call for calculated locations (addresses) in source RAM that do not exactly match the true/actual memory cell addresses. In these cases, the Reverse-Address Generator must generate addresses that are more precisely specified than the RAM's whole number address system. For example, the RAG can and does generate X and Y address coordinates that contain a fractional component (e.g., 0.2, 1.5, 3.2, 44.9), and thus an exact match cannot occur, since there is no such address in RAM. Thus, there is no true/actual source luminance or chrominance value that will suffice "as is" for the particular target pixel being constructed. So, an interpolation must be made.

Interpolator: The interpolated pixel value is simply a weighted average of the data values of the four source pixels surrounding the point calculated by the Reverse-Address Generator (see Figure 4-2). As stated previously, the Write Address Generator stores source pixel data values at RAM addresses whose coordinates are whole numbers. The Interpolator uses the fractional portions of the RAG's target address coordinates as a way of quantifying the distance (in both X and in Y) that exists between the calculated target

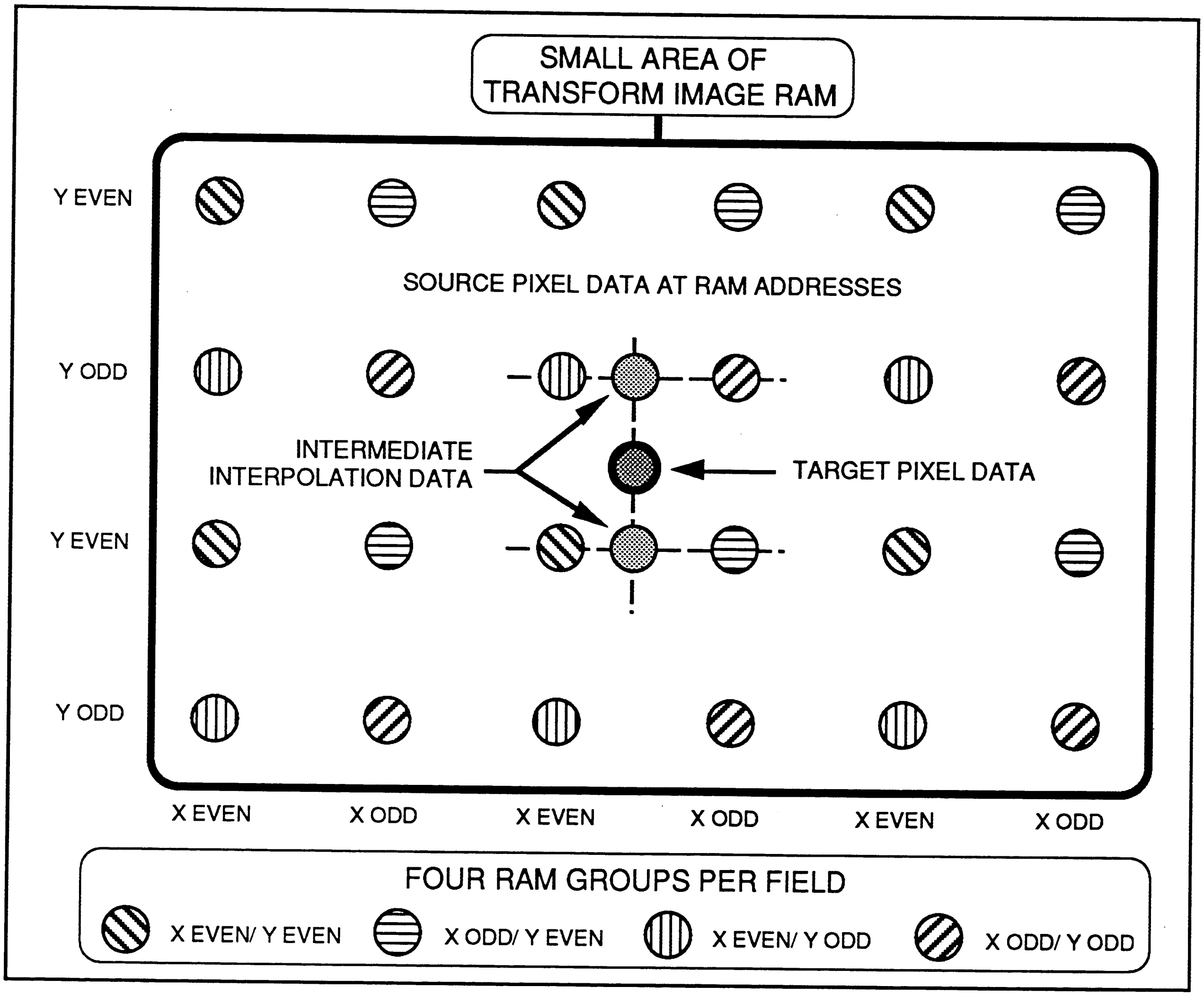

SMALL AREA OF TRANSFORM IMAGE RAM
Y EVEN
Y ODD
Y EVEN
Y ODD
SOURCE PIXEL DATA AT RAM ADDRESSES
INTERMEDIATE INTERPOLATION DATA
TARGET PIXEL DATA
X EVEN
X ODD
X EVEN
X ODD
X EVEN
X ODD
FOUR RAM GROUPS PER FIELD
X EVEN/ Y EVEN
X ODD/ Y EVEN
X EVEN/ Y ODD
X ODD/ Y ODD

Figure 4-2. Target Pixel Data Interpolation

pixel location and the source pixels' whole-number locations in RAM. This relative distance corresponds to the amount of interpolation needed.

As can be seen in figure 4-2, there are four source pixel addresses closest to the target pixel address. The four source pixels are stored in separate RAM from which their data can be accessed simultaneously. The Interpolator uses the two pairs of pixel data and the relationship of their addresses to the target pixel address in the X direction. The results are the two values of intermediate interpolation data shown. Next, the Interpolator uses these two values and the relationship of the target pixel address to their addresses in the Y direction. The final result is the target pixel data, which is then used as part of the transformed picture.

Then the entire interpolation process is repeated for each target pixel address. Each target pixel data value is interpolated from the data values of four source pixels, based on their relationship to the calculated target pixel address.

Transform Key Signal Generator: The Transform Key Signal Generator operation is based on addresses it receives from the Reverse-Address Generator. For cases where the RAG produces addresses outside the memory space, the Transform Key Signal Generator blanks the video by setting it to black.

As the video signals from the Interpolator and the Transform Key Signal Generator leave the Digital Video Processor Module headed for the Control Processor Module, they must be reclocked to match the system clock. This reclocking corrects for the delays incurred while the video data passed through the stages of the Digital Video Processor Module.

Control Processor Module (Video/Key Section)

Video and key signal processing on the Control Processor Module begins with retiming (delay) to match the buffered system clock. Then the signals are routed to the next functional block, which can be either the Standard Channel-1 Key Processor and Video Shaper

Circuit, located directly *on* the module, or the signals can be routed to the optional Channel-1/Channel-2 Combiner Submodule, which *plugs into* the Control Processor Module.

The Combiner Submodule (Optional)

In two-channel systems this circuitry combines the video signals from both channels into one video signal. It accepts a variety of key signals which it can process in a variety of ways. Then the Combiner outputs its processed video and key signals for further special effects processing.

Video Signal Processing: In cases where the two channels' image areas overlap, it becomes the job of the Combiner Submodule to determine which channel's image will cover, or appear in front of, the other. Varying input from the user adjusts the mixture of the overlapping images so that the channels may appear transparent to each other. The Combiner uses three factors to determine the mix of the overlapping video channels:

- Key strength of Channel 1
- Key strength of Channel 2
- Priority (which channel is covering the other)

The user adjusts these parameters by selecting two control panel pushbuttons (found in the TRANSITION section):

1. The OUTPUT KEY selection allows the user to adjust the percentage of key strength, which determines how transparent a channel's video will appear (see Figure 4-3). This affects the transparency of the channel's entire video image. You may adjust one channel, or both channels together, depending on how they are delegated on the panel.

2. The COMBINER selection allows the user to adjust the percentage of priority, which determines the transparency of the channel images to each other in the overlapping area only. This affects which channel appears in front of the other and allows a transition from a state where one channel has the highest priority to a state

where the other channel has priority. As one channel varies from 100 to 0 percent, the other channel varies from 0 to 100 percent.

So as the Combiner Submodule receives the two channels' video and keys, it uses information from the control panel to determine which channel is in front and how transparent it is to the channel being covered. As can be seen in Figure 4-3, this determination must be made in the video area where the two channels overlap. As the submodule processes pixel data from the overlapping area, the percentages of key strengths and priority, derived from user input, are used to set the blend of video from the two channels. The resulting video information exits the Combiner Submodule to the Control Processor Module for further processing.

To accomplish this, some of the Combiner is devoted to circuitry which is unique to the needs of Channel 1 video and key signals, supplementing that which is contained in the Standard Channel-1 Key Processor and Video Shaper Block on the Control Processor Module. The Combiner also contains all circuitry unique to Channel 2's video and key signals relative to processing for the special effects associated with the Combiner.

If the Combiner is not installed, microprocessor circuitry detects this and routes Channel 1's video and key signals to exit the stage directly. If the Combiner is installed, different paths are established, and the signals are routed instead to the Combiner submodule for fader processing and then stage outputting.

Key Signal Processing: Another important feature of the Combiner is that, for each channel, there are several ways in which pre-existing key signals can be processed and new key signals generated. These key signals are used downstream inside and outside the DPM-700 to perform linear, luminance, and transform keying of the DPM-700's manipulated video. A transform key cuts a hole which is always in the shape of the raster (of the manipulated video image area); in other words, it is always in the shape of at least a parallelogram, although it can be a rectangle if no skewing effect (a transformation) has been performed by the user.

Key signal processing circuitry exists only on the luminance bus; the resulting key signals are then fed to the chrominance bus to be used for video shaping and fading/prioritizing. Key signal processing for each channel is independent of the other channel.

Another key signal scenario is when either one of the video channels is used to carry a specially-formatted key signal, defined as standard composite video format. An example of this would be the key signal output from a character generator. The key signal defines the size and shape (but not the video fill) of the characters it is outputting. (The video fill is a separate output.)

The character generator's key signal output can be connected to a *video* input connector on the backplane, for example, into Channel 1's Input A. Then the key signal—the shapes, sizes, location, orientation, etc. of the characters—can be manipulated on Channel 1 just like a video signal. At the same time, its original matching matte-fill video (originating in the character generator), or some other video, can be used to fill-in the manipulated shapes of the characters. While the DPM-700's Channel 1 Transform Key Signal Generator still produces its own key signal, the Channel 1 key processing circuit would generate the beginnings of a luminance or linear key signal (KV1). This is routed to Channel 2's key signal processing circuitry. There the key signal would be selected, clipped, gained, etc., and finally output as part of the Combined Key Signal to be used downstream to cut holes in various background video. This would have the shape of proper characters, but could then be filled by some interesting video other than their original matte-fill from the character generator.

Channel 1 Key Processor and Video Shaper (Standard): The circuit operation of this stage is very similar to that of the Combiner Submodule Option immediately preceding this topic. You may notice that the block diagrams in the Drawings section of this manual for these two stages are very similar.

The main purposes of this stage are as follows:

1. To bridge Channel 1's luminance, chrominance, and key signals to the next (Recursive Memory) stage
2. To generate linear and luminance key signals, derived from the Channel-1 manipulated video arriving at this stage; these key signals are used downstream
3. To shape and use the fully-on, Channel-1 Transform Key Signal, when selected; to trim and shape its associated video from the Interpolator; and to blank invalid video
4. To process Ch 2's key signal, KV2, for use as a luminance or linear key signal (when Ch 2 is installed); the key signal is then shaped and can be used to trim the Channel-1 video, and it is finally output to the Recursive Memory stage
5. To allow substitution of internally generated matte luminance and chrominance for the primary manipulated luminance and chrominance on the video bus, as in cases of drop shadow
6. To facilitate rerouting of video and key signals to the Combiner Submodule when installed

If the Combiner Submodule Option is not installed, the DPM-700's control circuitry detects this and routes Channel 1's video and key signals to exit the stage directly. If the Combiner is installed, the signals are routed instead to the Combiner submodule for fader processing and drop shadow effect if desired, and finally to stage output.

Recursive Memory Submodule (Option)

(If this submodule is not installed, the control circuitry senses this and reroutes signals accordingly.) *Recursive* means to write again. This submodule produces a variety of recursive effects, including montage, trails, decay trails, star trails, strobe, etc. Recursive effects are accomplished by storing a particular video field or series of video fields into RAM and then mixing each one back-in later with another incoming video field. It is helpful to think of each one back-in later with another incoming video field. It is helpful to think of each incoming field as the "live", "current", or "new" field. Similarly, the stored field can also be thought of as the "recorded", "previous", or "old" one. Hereafter, the two fields will be referred to as *live* and *stored.*

This submodule receives three inputs from the Combiner:

1. CV-L (Combined Video—Luminance)
2. CV-C (Combined Video—Chrominance)
3. CKS (Combined Key Signal)

All of the following outputs from the Recursive Memory Submodule are sent to the Background Matte Adder stage:

1. RV-L (Recursed Video—Luminance)
2. RV-C (Recursed Video—Chrominance)
3. RKS (Recursed Key Signal).

As shown, the circuits for all three buses, Luminance (L), Chrominance (C), and Key (K), are separate but identical. Each bus consists of three main blocks: an Output Mixer, a Storage Mixer and RAM, and a Mix Control Keying subcircuit.

RAM: The RAM has a two-field capacity. It can either store or ignore any given field, depending upon the effect selected by the user. It can store a field for a variable period of time, also determined by the user. For example, for a montage effect, a particular stored field might remain in RAM until perhaps much later (say for 1000 fields) when it is read out of RAM and mixed back in with a new, live, quite different image field. Whereas, for various trailing effects, the stored field is read out and mixed back-in relatively soon after it was written into RAM (say within just a few fields).

When read out of RAM, the stored field passes through a Decay Rate Multiplier, which determines the percentage of stored video to be passed to both the Storage Mixer and the Output Mixer. Thus the Decay Rate Multiplier controls how much time it will take for a given stored field to fade out (decay).

Mixers: The stored signal via the Decay Rate Multiplier is fed back to the input of the Storage Mixer and also to the Output Mixer. The Storage Mixer includes a feedback loop that permits it to repetitively mix a stored video field or fields with live video fields to produce recursed video. The Output Mixer combines this recursed video with live video to create the final recursive effect.

Each mixer is independently controlled by its own set of two mix control key signals. One mix control key signal controls the live video, and the other one controls the stored video. The two key values for any given mix are complementary (i.e., they must add up to the full mix control value, namely 1). The keying determines where in the field and how much of each signal will be passed, and thus the priority or dominance of one signal over the other (if any). Finally, the output of the Output Mixer is sent on to the next major stage, the Background Matte Adder.

Background Matte Adder: This stage keys-in the combined manipulated image area over a full-screen background matte which this stage generates. At the control panel, the user controls the luminance and chrominance attributes of the matte. The background matte is only visible, of course, if some compression of the image area has occurred upstream, through the Transform Subsystem. This stage, however, serves no cropping function.

In this stage, the circuitry and operational capability for the luminance and chrominance buses are separate but identical. The key signal from the Recursive Memory stage is used to process both video buses here. The circuitry for processing each bus consists of these three main blocks:

1. Background Matte Generator
2. Background Matte Adder (a keyer/mixer)
3. Video Unshaper

BACKGROUND MATTE GENERATOR: Luminance and chrominance values for the Background Matte Generator come from the CPU, having been translated from soft- and hard-control selections made by the operator. These values control the attributes of the matte to be generated. Upon cue from the CPU, the values are latched in their respective Y or C latch and are used as the basis for generating a matte of a particular hue, luminance, and saturation. Each of the two control buses is delayed as needed to synchronize with the video bus.

BACKGROUND MATTE ADDER: The Background Matte Adder circuitry uses the key signal from the Combiner to determine the complementary amount of matte to add to the foreground (post-Combiner) video. Because the key signal was used in the Combiner to create the shaped foreground video, the key signal inherently represents the desired mixture ratio of the foreground video to the background matte.

VIDEO UNSHAPER: In addition to generating and adding a background matte, this stage can also "unshape" or "unsoften" the video before it is sent to the succeeding Downstream Keyer stage. Unshaping is done in the Video Unshaper circuit by dividing the video pixel value by the key signal value. The reason for unshaping is that the preceding Combiner stage always shapes (softens) the signal by multiplying the primary video by the key signal, pixel-by-pixel. But the Keyer cannot use the shaped Combiner output because it must always start with unshaped video so that it can apply its own internal shaping. Therefore, whenever the Downstream Keyer is selected, the Video Unshaper is turned on by the CPU and removes shaping from the Combiner output video in preparation for the keyer.

Similarly, if the DPM-700's Clean Feed Outputs have been configured (via the software) for use in an external keyer, the CPU will command the Background Matte Adder circuit to unshape the video signal.

The Interface Module (Video/Key Output)

The output subsection is divided into two major functional categories: Output Processing and Analog Keying.

Output Processing begins with three inputs from the Control Processor Module: the two digital video signals (luminance and chrominance) plus the digital key signal (each on its own 8-bit bus). The three digital input signals are processed to produce five outputs:

1. Digital Clean Feed (Video before the Keyer)
2. Analog Clean Feed (Video before the Keyer)
3. Program Out (Video after the Keyer)
4. Analog Key Signal
5. Digital Key Signal

Video Output Processing: As shown on the System Block Diagram, the two video buses, luminance and chrominance, arrive at the Encoder where they are combined onto a single bus. Thereafter the video signal is referred to as "composite". Sync and Burst are then added back into the signal. (Recall that Sync and Burst are stripped off during the first stage of the Digital Video Processor Module. Sync and Burst are not used during the entirety of digital video processing but, of course, must be added back for outputting composite video to feed other equipment.

This composite video then goes two places: First, it is buffered and then sent to the Digital Clean Feed output (Clean Feed means that it is taken *before* the analog keyer); second, it is converted to analog form by the DAC (digital-to-analog converter). The output of the DAC is buffered and sent to the Analog Clean Feed output, and it also becomes the foreground input to the Keyer. In the Keyer, this video can be keyed-in over some externally input background video or it can be passed unaltered if the keyer is turned off. After the Keyer, the video signal passes through the Fade To Black (FTB) Mixer, which controls the mix of black and video during a fade to black, and it also passes through the Crosshair Inserter circuit for insertion of the crosshair cursor onto the video. Finally, the video output is buffered and sent out out via the Program Out connector.

Keying: The digital key signal from the Control Processor Module is used in two ways: first, it is buffered to ECL levels, and then output as the Digital Key Output; second, it goes on through its DAC and is used in two places: first, as the key control signal for the Keyer (for keying-in the DPM-700's video over the external background video); second, it is buffered and output as the Analog Key Output.

Control Subsystem

As shown in Figure 4-3, the Control Subsystem includes three data processors: the Control Panel Processor, the Communications Processor, and the Transform Processor, plus the module Control Bus Interfaces (CBIs) and the various other buses and interconnections among all these elements.

Each Processor circuit functions much like an independent microcomputer, networked together with the other stations in the control system. The Control Panel Processor, centered around a 68010 microprocessor (CPU) is located in the control panel on the Control Processor Board. The Communications and Transform Processors are located in the frame on the Control Processor Module, and share a dual port RAM. The Communications Processor, like the Control Panel Processor, is centered around a 68010 microprocessor. The Transform Processor, uses an even higher-level microprocessor, the EC030. It is this third computer which controls the video processing hardware via the System Bus, which consists of data, address, and control buses.

Each of the three CPUs have their own boot-up routines. Once booted, they all go to a set-up state and wait for instructions from the user via the control panel's processor. The set-up state is a set of control panel settings that are factory default settings, or they can be settings you have established prior to the current boot-up, using the {Eng} menu of the STREAMLINE® Display.

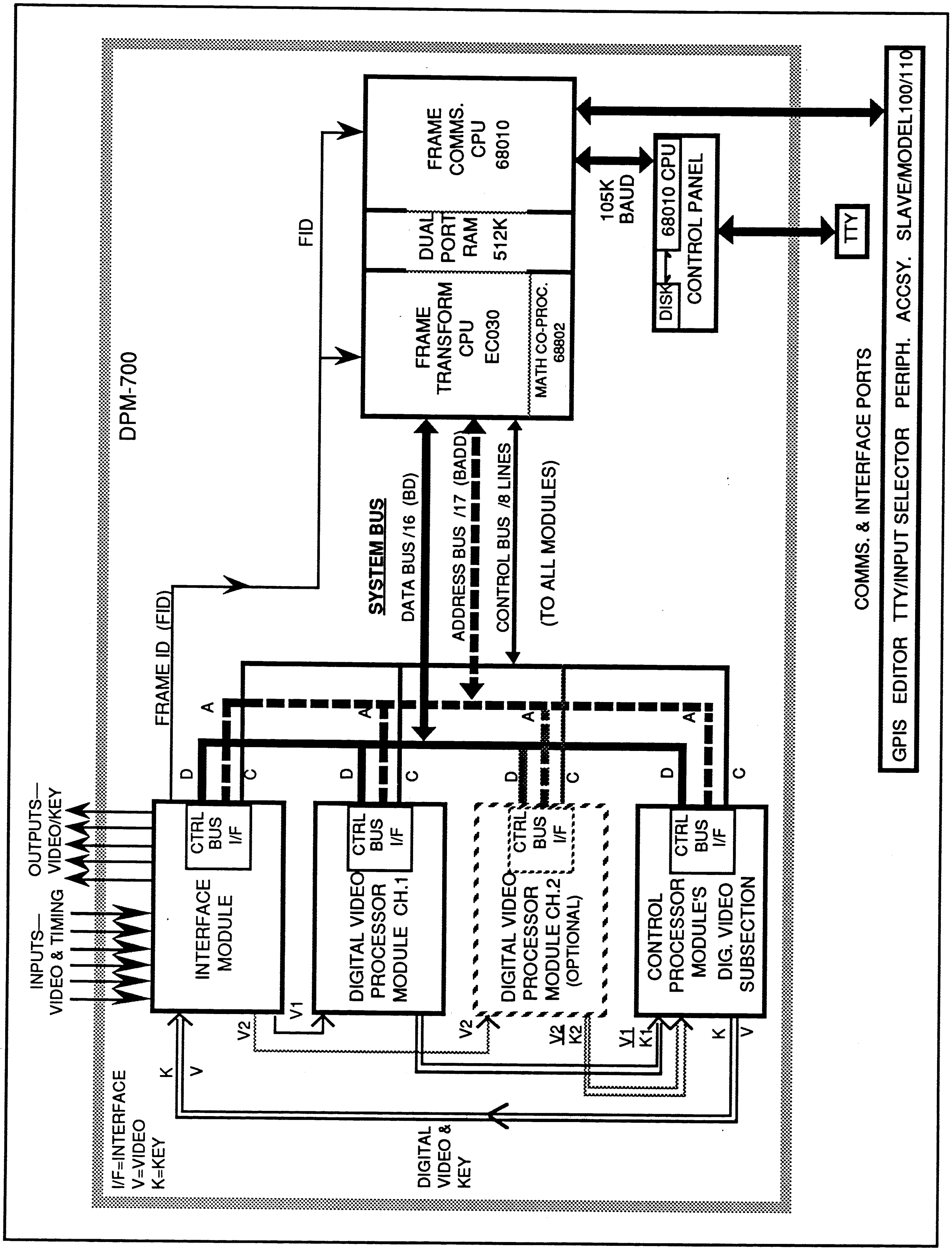

DPM-700
FRAME COMMS. CPU 68010
DUAL PORT RAM 512K
FRAME TRANSFORM CPU EC030
MATH CO-PROC. 68802
FID
105K BAUD
68010 CPU
DISK
CONTROL PANEL
TTY
COMMS. & INTERFACE PORTS
GPIS EDITOR TTY/INPUT SELECTOR PERIPH. ACCSY. SLAVE/MODEL100/110
SYSTEM BUS
DATA BUS /16 (BD)
ADDRESS BUS /17 (BADD)
CONTROL BUS /8 LINES
(TO ALL MODULES)
FRAME ID (FID)
A
D
C
CTRL BUS I/F
INTERFACE MODULE
DIGITAL VIDEO PROCESSOR MODULE CH.1
DIGITAL VIDEO PROCESSOR MODULE CH.2 (OPTIONAL)
CONTROL PROCESSOR MODULE'S DIG. VIDEO SUBSECTION
INPUTS— VIDEO & TIMING
OUTPUTS— VIDEO/KEY
V1
V2
V2 K2
V1 K1
K
V
I/F=INTERFACE
V=VIDEO
K=KEY
DIGITAL VIDEO & KEY

Figure 4-3. Overview of the Control Subsystem

The following description assumes all CPU subsystems are functioning in their normal operating mode, not in a diagnostic, service mode.

Panel CPU Subsystem

This subsystem sends and receives information to and from the frame's Communications CPU Subsystem, which then relays it via the Dual Port RAM, to the Transform CPU Subsystem, and/or via its communications and interface ports to various peripheral devices, such as an editor.

The Panel CPU Subsystem detects changes in the panel's controls, then translates and relays them to the frame's Communications CPU Subsystem for further processing.

The Panel CPU likewise processes and uses data from the built-in disk drive, and can relay that data to the Communications CPU Subsystem for further processing.

The Panel CPU also *receives* data from the Communications CPU Subsystem, which is used to control the state of the panel's indicator lights, main software display, secondary dynamic displays, and the back-lit (LED) indicators.

In a few cases, the Panel CPU receives change information from panel controls, independently processes it, and directly communicates status back to pushbutton lamps.

The state of the Panel CPU Subsystem can be constantly monitored via its TTY port. The Panel CPU Subsystem, with its main parts and functions, is shown in Figure 4-4.

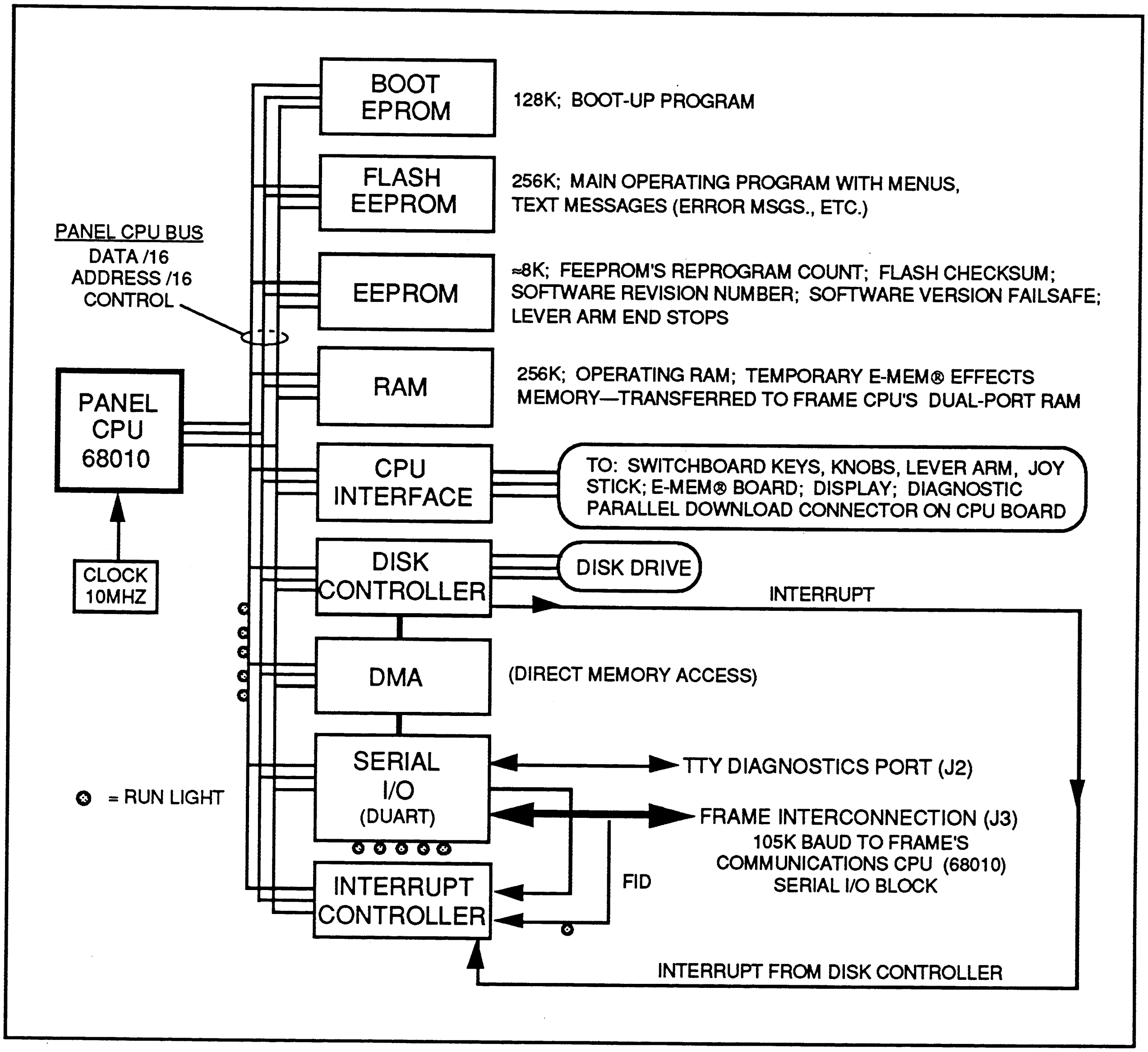

BOOT EPROM
128K; BOOT-UP PROGRAM
FLASH EEPROM
256K; MAIN OPERATING PROGRAM WITH MENUS, TEXT MESSAGES (ERROR MSGS., ETC.)
PANEL CPU BUS
DATA /16
ADDRESS /16
CONTROL
EEPROM
≈8K; FEEPROM'S REPROGRAM COUNT; FLASH CHECKSUM; SOFTWARE REVISION NUMBER; SOFTWARE VERSION FAILSAFE; LEVER ARM END STOPS
PANEL CPU 68010
RAM
256K; OPERATING RAM; TEMPORARY E-MEM® EFFECTS MEMORY—TRANSFERRED TO FRAME CPU'S DUAL-PORT RAM
CPU INTERFACE
TO: SWITCHBOARD KEYS, KNOBS, LEVER ARM, JOY STICK; E-MEM® BOARD; DISPLAY; DIAGNOSTIC PARALLEL DOWNLOAD CONNECTOR ON CPU BOARD
CLOCK 10MHZ
DISK CONTROLLER
DISK DRIVE
INTERRUPT
DMA
(DIRECT MEMORY ACCESS)
SERIAL I/O (DUART)
TTY DIAGNOSTICS PORT (J2)
⊗ = RUN LIGHT
FRAME INTERCONNECTION (J3)
105K BAUD TO FRAME'S COMMUNICATIONS CPU (68010) SERIAL I/O BLOCK
FID
INTERRUPT CONTROLLER
INTERRUPT FROM DISK CONTROLLER

Figure 4-4. Control Panel CPU Subsystem

Communications CPU Subsystem

The Communications CPU Subsystem is shown in Figure 4-5. This subsystem performs many important functions for the Control Subsystem. It stores and handles the main operating programs for its own CPU and for the Transform CPU Subsystem. It also acts as a liason processor among all the many interactive components and devices spanning the control, timing, and video/key processing subsystems.

In one function, this subsystem receives and processes panel changes, and then sends them on to one or both of two places: (1) via the Dual Port RAM to the Transform CPU for more processing and final relaying to the Video/Key Manipulation hardware; or (2) via its communications and interface ports to various peripheral devices, such as an editor.

Conversely, the Communications CPU Subsystem can relay information *from* the peripheral devices *to* the Panel CPU Subsystem or the Transform CPU Subsystem. Information from a peripheral device could be in the form of editor commands. Information from the Transform CPU could be updates for the panel's control or displays.

The state of the Communications CPU Subsystem can be constantly monitored via the frame's TTY port.

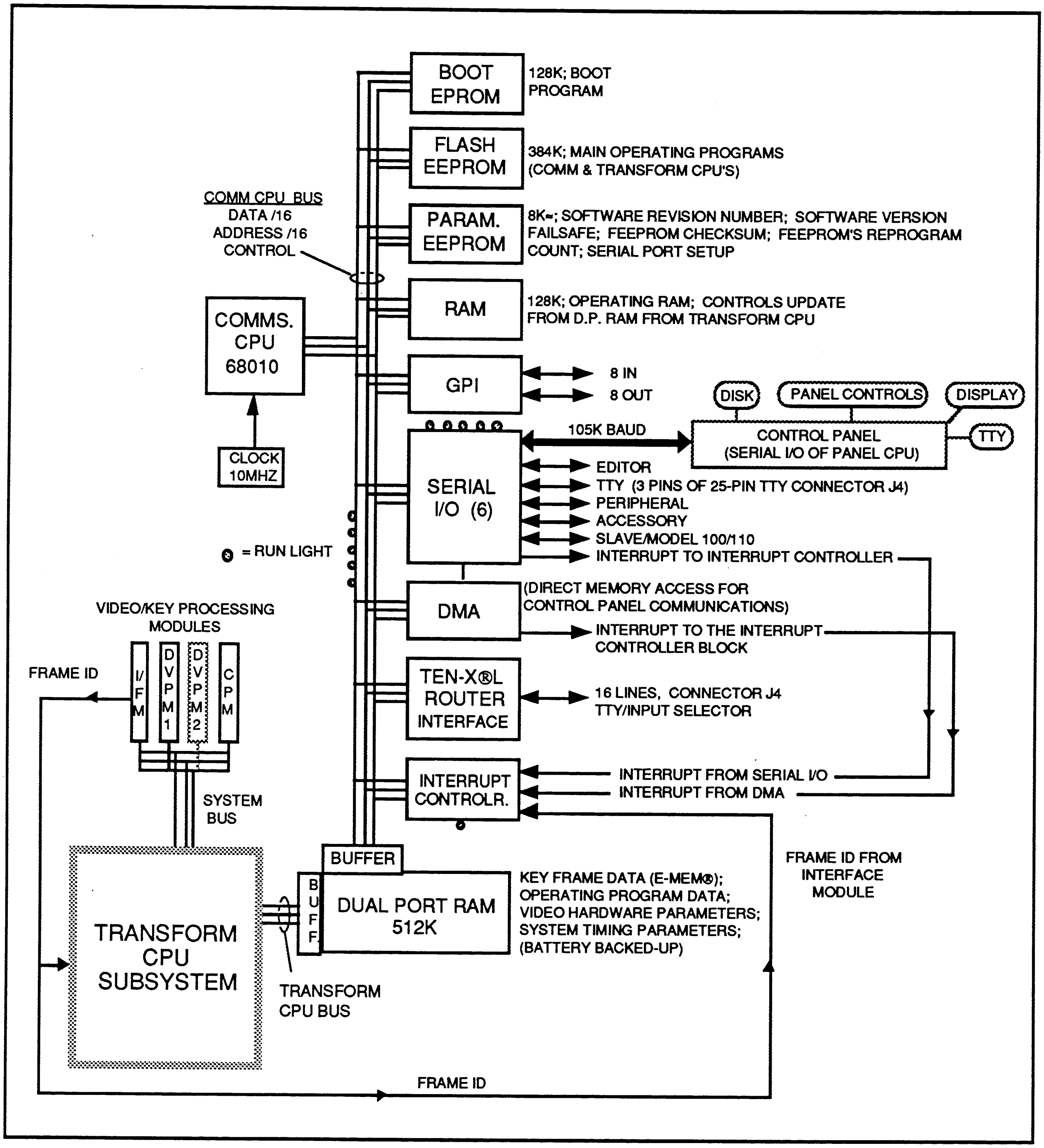

BOOT EPROM
128K; BOOT PROGRAM
FLASH EEPROM
384K; MAIN OPERATING PROGRAMS (COMM & TRANSFORM CPU'S)
COMM CPU BUS
DATA /16
ADDRESS /16
CONTROL
PARAM. EEPROM
8K-; SOFTWARE REVISION NUMBER; SOFTWARE VERSION FAILSAFE; FEEPROM CHECKSUM; FEEPROM'S REPROGRAM COUNT; SERIAL PORT SETUP
COMMS. CPU 68010
RAM
128K; OPERATING RAM; CONTROLS UPDATE FROM D.P. RAM FROM TRANSFORM CPU
GPI
8 IN
8 OUT
DISK
PANEL CONTROLS
DISPLAY
CLOCK 10MHZ
105K BAUD
CONTROL PANEL (SERIAL I/O OF PANEL CPU)
TTY
SERIAL I/O (6)
EDITOR
TTY (3 PINS OF 25-PIN TTY CONNECTOR J4)
PERIPHERAL
ACCESSORY
SLAVE/MODEL 100/110
INTERRUPT TO INTERRUPT CONTROLLER
= RUN LIGHT
VIDEO/KEY PROCESSING MODULES
DMA
(DIRECT MEMORY ACCESS FOR CONTROL PANEL COMMUNICATIONS)
INTERRUPT TO THE INTERRUPT CONTROLLER BLOCK
FRAME ID
I/FM
DVPM 1
DVPM 2
CPM
TEN-X®L ROUTER INTERFACE
16 LINES, CONNECTOR J4 TTY/INPUT SELECTOR
INTERRUPT CONTROLR.
INTERRUPT FROM SERIAL I/O
INTERRUPT FROM DMA
SYSTEM BUS
BUFFER
FRAME ID FROM INTERFACE MODULE
BUFF
DUAL PORT RAM 512K
KEY FRAME DATA (E-MEM®); OPERATING PROGRAM DATA; VIDEO HARDWARE PARAMETERS; SYSTEM TIMING PARAMETERS; (BATTERY BACKED-UP)
TRANSFORM CPU SUBSYSTEM
TRANSFORM CPU BUS
FRAME ID

Figure 4-5. The Frame's Communications CPU Subsystem

Transform CPU Subsystem

(Shown in Figure 4-6.) Besides being involved in the interactive processes already described relative to the Panel CPU Subsystem and the Communications CPU Subsystem, the Transform CPU Subsystem also receives direct, control-related input from one of the video/key processing modules, the Interface Module. This input tells the Transform CPU about the configuration (format, channel submodule status, etc.), and thus determines the manner in which the Transform CPU will perform its tasks.

This subsystem serves primarily as the main computer for controlling the panel's visual (interactive) feedback to the user and for controlling the video processing hardware on the frame modules so that the hardware will produce the effects the user wants. Its main function is to receive and interpret the user's requests. It also makes the many calculations needed to produce the panel and video hardware operating parameters. The subsystem sends those parameters to the panel controls and video hardware once per field. Field synchronization is established by the Frame ID (FID) signal from the Interface Module. (Recall that all three CPU circuits are synchronized with the video system by the same FID signal.)

The extensive and demanding calculations needed to produce the operating parameters are made possible using a 68882 math co-processor in the subsystem. This relieves a substantial load.

The status of the Transform CPU Subsystem can be constantly monitored via the frame's TTY port.

Control Bus Interface (CBI)

Each module has its own CBI, even the Control Processor Module (on which the Transform CPU circuitry resides). Its CBI is needed for the digital video/key circuitry which also resides on that module.

Each CBI decodes the control signals coming down the System Bus to its particular module. Decoding involves comparing its own address with each one that the Transform CPU sends out on the bus. When it finds a match (meaning that the Transform CPU is

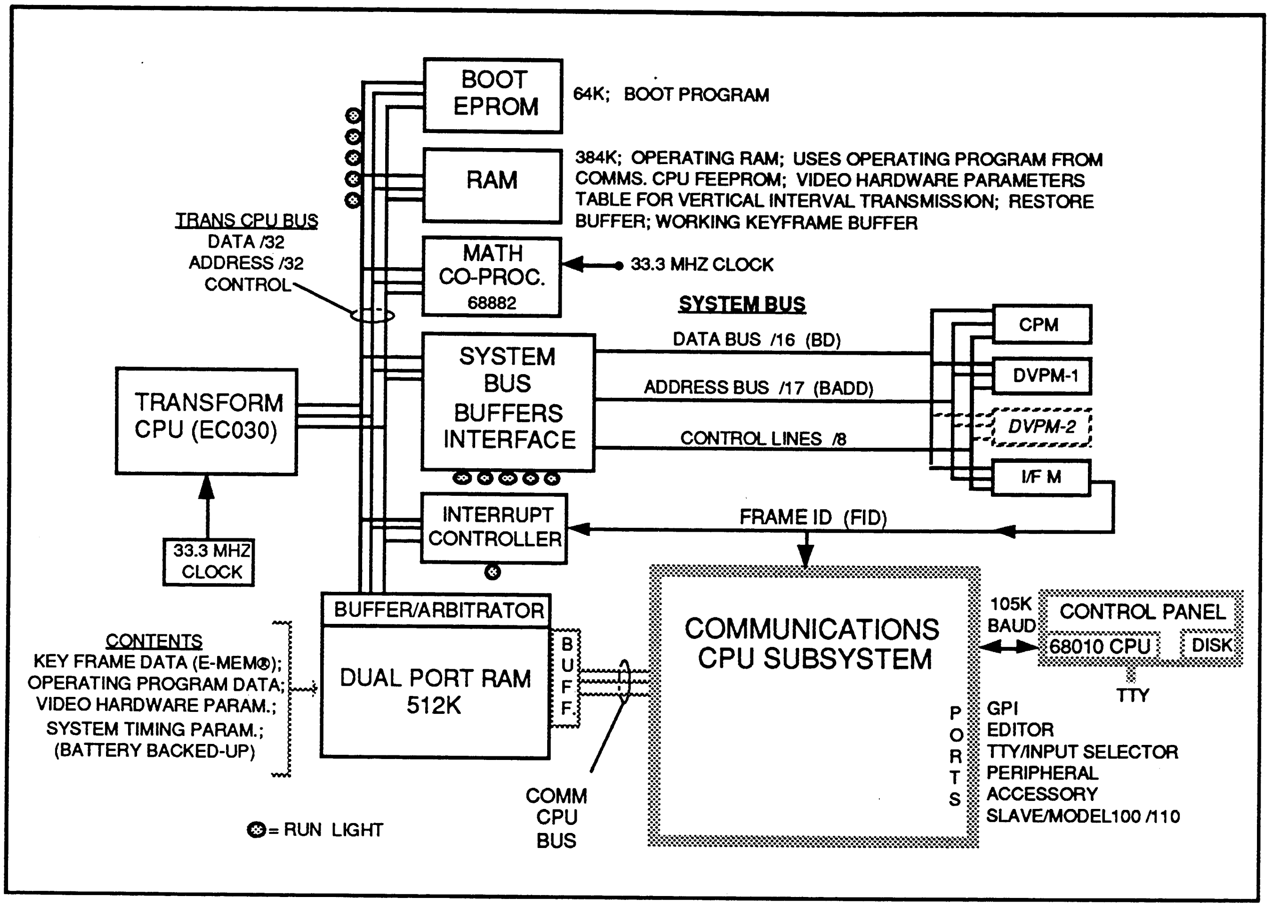

BOOT EPROM
64K; BOOT PROGRAM
RAM
384K; OPERATING RAM; USES OPERATING PROGRAM FROM COMMS. CPU FEEPROM; VIDEO HARDWARE PARAMETERS TABLE FOR VERTICAL INTERVAL TRANSMISSION; RESTORE BUFFER; WORKING KEYFRAME BUFFER
TRANS CPU BUS
DATA /32
ADDRESS /32
CONTROL
MATH CO-PROC. 68882
33.3 MHZ CLOCK
SYSTEM BUS
DATA BUS /16 (BD)
ADDRESS BUS /17 (BADD)
CONTROL LINES /8
SYSTEM BUS BUFFERS INTERFACE
TRANSFORM CPU (EC030)
CPM
DVPM-1
DVPM-2
I/F M
INTERRUPT CONTROLLER
FRAME ID (FID)
33.3 MHZ CLOCK
BUFFER/ARBITRATOR
DUAL PORT RAM 512K
BUFF.
CONTENTS
KEY FRAME DATA (E-MEM®);
OPERATING PROGRAM DATA;
VIDEO HARDWARE PARAM.;
SYSTEM TIMING PARAM.;
(BATTERY BACKED-UP)
COMMUNICATIONS CPU SUBSYSTEM
105K BAUD
CONTROL PANEL
68010 CPU
DISK
TTY
PORTS
GPI
EDITOR
TTY/INPUT SELECTOR
PERIPHERAL
ACCESSORY
SLAVE/MODEL100 /110
COMM CPU BUS
= RUN LIGHT

Figure 4-6. The Frame's Transform CPU Subsystem

talking to the particular CBI's module), the CBI passes the data on to the next level of decoder. This decoder directs the data to the appropriate section on the module and to the component intended to receive the message.

Integrated CPU Operations

A typical scenario occurs as follows: the Communications CPU begins looking for control input from any of its I/O sources (the panel, editor, a GPI port, etc.). If it receives change input, it communicates it to the Transform CPU. The Transform CPU computes (with the help of its math co-processor) the necessary data needed to synthesize fields in between each pair of key frames given. For example, the user determines the duration of the key frames at the control panel. His input tells the Transform CPU how many fields to create between key frames, or how long the effect takes from one key frame to the next.

The Transform CPU puts in the Dual Port RAM the needed parameters to send to the Communications CPU, which then, if necessary, sends the data on to the Panel CPU to update the status of displays and switches on the control panel.

The Transform CPU sends out updates on the system bus on a field-by-field basis to the video and timing hardware. Between vertical (blanking) intervals, the control system is processing for the next field. Then during the first 10 lines of each field (vertical blanking interval), the control system updates all the pertinent video and timing hardware.

The Timing (Pulse Regeneration) Subsystem

This description refers to drawing 00-064702-XX (NTSC) or 00-064722-XX (PAL), the block diagram for the Interface Module, found in the Drawings section of this manual; specifically, this description coincides with the Timing Reference Genlock portion of the diagram. Additional background information is available from the GVG booklets, "PAL Studio Timing: Principles and Applications" or "NTSC Studio Timing: Principles and Applications", available from your local GVG distributor or sales representative.

The overall function of this subsystem is to synchronize all of the video and key signal processing circuitry in the DPM-700. Separate output and input sync pulse generators are standard in the DPM-700. The output sync pulse generators allow the DPM-700 to be easily used in and timed to virtually any video studio system and eliminates the need for a separate, external sync pulse generator to time the DPM-700. The DPM-700's built-in input sync pulse generators allow the user to time input devices, such as character generators, tape machines, etc., and again eliminate the need for external sync pulse generators.

The DPM-700's timing circuits operate by genlocking to a timing reference input, which is a stable composite video source (containing sync and burst), preferably color black, as the waveforms indicate on the diagram. Once the Program Output of the DPM-700 is genlocked to the timing reference, the Program Output becomes the zero reference for the video and key signal inputs and outputs to and from the DPM-700.

The DPM-700 dynamically adapts to a wide range of input and output timing requirements through the use of separate input timing circuitry for each manipulation channel, as well as separate output timing circuitry.

The user can store different sets of timing controls for up to twenty different inputs (if a 10x1 input selector is used on both channels) plus those for the outputs. These sets can apply to different configurations (i.e., how the DPM-700 fits into a given studio or editing session), and the user can dynamically switch among them, even during sessions, without recabling. Thus, it is possible for the DPM-700 to be at one time configured (cabled) for use both upstream *and* downstream of a production switcher. Also, these sets of parameters can be transferred among DPM-700s on 3.5 inch floppy disks.

Timing Reference Processing

There are two main subsets of this subsystem: subcarrier processing and sync processing. Subcarrier processing is done first, and sync processing is largely done downstream. Subcarrier processing has four main purposes, all of which depend upon separate sync processing:

- to generate a system clock which is genlocked to the phase of the timing reference
- to generate timing pulses which provide independent, dynamically user-controlled phasing of the output sync pulse generator which, in turn, governs the output timing circuitry and the Crosshair Generator
- to generate timing pulses which provide independent, dynamically user-controlled phasing of the two input sync pulse generators, one each for the two manipulation channels, which, in turn, govern their channel's input timing circuitry
- to facilitate SC/H phasing.

Sync processing has two main purposes (both of which depend upon the subcarrier processing just described above): (1) to facilitate SC/H phasing, and (2) to help govern the input and output sync pulse generators, which facilitate separate variable and dynamic timing control over the DPM-700's output and input timing circuitry.

Processing of the timing reference signal begins with buffering for load isolation and common mode noise rejection.

NTSC Subcarrier Processing: The Tapped Delay Line, Tap Selector, Delay, Mixer, and DAC all work together with the Clock Divider (at the bottom of the diagram), all under user control, to place the burst phase of the reference on the zero-degree vector for system (studio) color matching.

Beginning with the Color Lock block, the phase-adjusted reference signal is used to derive a genlocked system clock (CLK) and its harmonic derivatives to govern timing of other timing circuitry in the DPM-700 and to govern its input and output video processing circuits. The system clock and the genlocking subcircuit use a phase-locked loop additionally consisting of the Sync Separator, Error Amp, Lock Detector, VCXO (Voltage Controlled Crystal Oscillator), and Clock Divider. One of the output pulses from the Clock Divider (2fsc) is used in the SC/H Tracker subcircuit described later.

The Sync Separator also produces Separated Reference Sync used in two main areas: the Output and Input Sync Pulse Generators (SPGs) to give a vertical reference (detailed later) and also the SC/H Tracker subcircuit, which involves all the blocks and feedback loops in between the Sync Separator and the Pulse Former. The SC/H Tracker ensures that the proper SC/H phase relationship is maintained for the horizontal load pulse, HLD, produced by the Pulse Former, which ultimately drives all three sync pulse generators. The SC/H Tracker (the resulting phase relationship between HLD and the phase of the subcarrier) can be reset in one of three ways via its Reset Timer (a one shot), located in the SC/H Tracker's feedback loop: (1) when the Limit Detector receives an error voltage which is beyond acceptable circuit limits; (2) when the SC/H RESET pulse is received from the control circuitry whenever the user is adjusting the phase setting from the control panel; and (3) when the VIDEO PRESENCE DETECTOR (VPD) pulse is received from the Output Sync Pulse Generator, indicating the timing reference video has been interrupted and reestablished.

The Pulse Former produces HLD, the Horizontal Load Pulse which is used by the Output Sync Pulse Generator (described below). It also drives the HLD Generator-Decoder Phaser whose outputs help to govern the respective Input Sync Pulse Generators and Decoder used for input video and key signal processing.

NTSC Output Sync Pulse Generator: Its purpose is to produce advanced or delayed timing pulses needed by the video, key, and control processing circuitry in the DPM-700 having to do with the "output" or "target" realm of image manipulation. The degree of advance or delay is under user control as part of the set-up procedures, and allows the DPM-700, as a source device, to be timed to fit into a wide range of studio configurations. The Output Sync Pulse Generator receives the following inputs, all of which come from the DPM-700's timing circuitry just described:

- Separated Reference Sync from the Sync Separator
- Horizontal Load Pulse (HLD) from the Pulse Former, indicates proper SC/H phase relationship for output sync pulses
- CLK (the system clock) from the VCX Oscillator
- 2fsc from the Clock Divider
- the subcarrier from the Clock Divider
- control bus data from the Bus Interface [on this module] (BDBI), control bus addresses from the Bus Interface (BADBI), and control bus enable pulses from the Bus Interface (ENA).

The Output Sync Pulse Generator, under user control, advances or delays the operation of the following circuits: (1) the control subsystem's CPUs, (2) the Reverse-Address Generator (RAG) and Recursive Memory (option) as to when video and key data will be read out of memory, (3) video and key signal output processing (digital-to-analog conversion) and final (external background) keying, and (4) output crosshair (cursor) generation. The Output Sync Pulse Generator maintains the same color framing field as that of the timing reference signal. Listed below are the Output Sync Pulse Generator's outputs:

- KEY_ADV_CB (Keyer Advanced Composite Blanking) is sent to the Analog Keyer (on this module) and used to compensate for output timing adjustments when the DPM-700 is operating in the upstream mode relative to a production switcher.
- FID (Field Identification) marks the beginning of each field and is used to synchronize the entire control subsystem, including the control panel. In

this role, it tells the CPU when to transmit video/key hardware parameters (at the start of the vertical interval); it also synchronizes the video and key signal processing circuits, for example, the output side of the Transform Subsystem's RAM governed by the Reverse-Address Generator. FID also drives the Output Vertical Pulse Generator (detailed below).

- H/2 (Horizontal over 2) goes to the Sync-Burst Adder in the output processing section of the Interface Module, and defines the proper phase of burst for reconstructing the composite video waveform.
- CS (Composite Sync) also goes to the Sync Burst Adder and defines the correct location of sync.
- ADV_CB (Advanced Composite Blanking) also goes to the Sync Burst Adder and defines the standard composite blanking interval; does not contain sync and burst.
- VD (Vertical Drive) also goes to the Sync Burst Adder and defines where the vertical interval begins.
- VPD (Video Presence Detector) goes back to reset the SC/H Tracker when the timing reference video is reestablished after an interruption; VPD also goes to the control system so that it can display a message on the control panel that the timing reference has been interrupted.
- HD (Horizontal Drive) governs the Output Horizontal Pulse Generator (described below).

The Output Horizontal Pulse Generator has three outputs with the following functions:

- HCO (Horizontal Count): a sequential up-counter; used along with VCO (Vertical Count, listed below) in the Crosshair Generator subcircuit
- OH (Output Horizontal): for all video/key hardware after the Transform Image RAM (target space); used along with pulse OV (below), to

determine when the Reverse-Address Generator reads data out of memory

- CPDAC (Clamp Pulse for Digital-to-Analog Conversion): a backporch clamp for the DAC filter; used for dc-level restoration during output processing; also known as the sampling pulse.

The Output Vertical Pulse Generator has two outputs with the following functions:

- VCO (Vertical Count): a sequential up-counter; used along with HCO (Horizontal Count, listed above) in the Crosshair Generator subcircuit
- OV (Output Vertical): for all video/key hardware after the Transform Image RAM (target space); used along with pulse OH (above) to determine when the Reverse-Address Generator reads data out of memory.

NTSC Sync Pulse Generator (Ch. 1): Allows independent advance or delay of timing circuitry dealing with the input or "source space" realm of the DPM-700 and provides the user much flexibility in timing his input video and key sources to the particular system involved. This circuit operates very much like the Output Sync Pulse Generator circuitry and allows input timing settings to be stored on and loaded from disk. This circuit consists of Ch.1 Sync Pulse Generator, Horizontal Pulse Generator, and Vertical Pulse Generator. (The design for Ch. 2 is the same as that for Ch. 1.) Its outputs and their functions follow:

- FID_1: (Field Identification) same as the Output Sync Pulse Generator description but has independent timing
- HD_1: (Horizontal Drive) same as the Output Sync Pulse Generator description but has independent timing

The Ch. 1 Horizontal Pulse Generator produces these outputs with the following functions:

- IH1 (Input Horizontal Ch. 1): a timing signal for the input side of the Transform Image RAM via the Write-Address Generator, i.e., when data is written into memory

- CP1A (Clamp Pulse Channel 1): a sync-tip clamp for rejecting hum during sampling on the input submodule
- CP1ADC (Clamp Pulse Channel 1 for Analog-to-Digital Conversion): This backporch clamp puts the signal at the proper level for proper sampling by the ADC

The Ch. 1 Vertical Pulse Generator produces these outputs with the following functions:

- V_RST_1 (Vertical Reset Ch. 1): for controlling input resolution improvement memory on Input Submodule
- IV1 (Input Vertical Ch. 1): to the input side of the Transform Image RAM; a timing signal for the Write-Address Generator; used to define active video interval

NTSC Input Sync Pulse Generator (Ch. 2): Consists of Ch.2 Sync Pulse Generator, Horizontal Pulse Generator, and Vertical Pulse Generator. (The design for Ch. 1 is the same as that for Ch. 2.) Its outputs and their functions follow:

- FID_2: (Field Identification) same as the Output Sync Pulse Generator description but has independent timing
- HD_2: (Horizontal Drive) same as the Output Sync Pulse Generator description but has independent timing

The Ch. 2 Horizontal Pulse Generator produces these outputs with the following functions:

- IH2 (Input Horizontal Ch. 2): a timing signal for the Transform Image RAM via the Write-Address Generator, i.e., when data is written into memory

- CP2A (Clamp Pulse Channel 2): a sync-tip clamp for rejecting hum during sampling on the input submodule

- CP2ADC (Clamp Pulse Channel 2 for Analog-to-Digital Conversion): this backporch clamp puts the signal at the proper level for proper sampling by the ADC

The Ch. 2 Vertical Pulse Generator produces these outputs with the following functions:

- V_RST_2 (Vertical Reset Ch. 2): for controlling input resolution improvement memory on Input Submodule

- IV2 (Input Vertical Ch. 2): to the input side of the Transform Image RAM; a timing signal for the Write-Address Generator; used to define active video interval

The NTSC Crosshair Generator: This circuit consists of the Horizontal Comparator; Vertical Comparator; and Crosshair Generator itself, used to produce the Crosshair Fill Video (CHF); the Crosshair Key signal (CHK); and the Not Crosshair Key signal (/CHK). These three outputs are sent to the Crosshair Inserter in the output processing stage of the Interface Module, following the final Keyer and Fade-to-Black Mixer. The Crosshair Generator's comparators compare horizontal and vertical counts with horizontal and vertical control data specifying a starting reference and the amount of change in controls, resulting in H_TRIG (Horizontal Trigger) and V_TRIG (Vertical Trigger), which define where the starting point for each channel's crosshair key should be for each field. The fill pattern is selectable, and is separate for the two channels.

PAL Subcarrier Processing: The Tapped Delay Line, Tap Selector, Delay, Mixer, and DAC all work together with the Clock Divider (at the bottom of the diagram), all under user control, to place the burst-phase reference on the 135-degree and 225-degree vectors for system (studio) color matching.

Beginning with the Color Lock block, the phase-adjusted reference signal is used to derive a genlocked system clock (CLK) and its harmonic derivatives to govern timing of other timing circuitry in the DPM-700 and to govern its input and output video processing circuits. The system clock and the genlocking subcircuit use a phase-locked loop additionally consisting of the Sync Separator, Error Amp, Lock Detector, VCXO (Voltage Controlled Crystal Oscillator), and Clock Divider. Three of the output pulses from the Clock Divider are used in the SC/H Tracker subcircuit described later. They are 180_SC, 270_SC, and 8.86A.

The Sync Separator produces Separated Reference Sync (CSI) which is used in the SC/H Tracker References Circuit to generate RH/2, /RH/2 (not RH/2), REF_H, and REF_VERT. /RH/2 is used in the color lock circuitry and the other three are used in the SC/H Tracker subcircuit, which involves all the blocks and feedback loops in between the Sync Separator and the Pulse Former. The SC/H Tracker ensures that the proper SC/H phase relationship is maintained for the vertical load pulse, VF, produced by the Pulse Former, which ultimately drives all three sync pulse generators. The SC/H Tracker (the resulting phase relationship between VF and the phase of the subcarrier) can be reset in one of three ways via its Reset Timer (a one shot), located in the SC/H Tracker's feedback loop: (1) when the Limit Detector receives an error voltage which is beyond acceptable circuit limits; (2) when the SC/H RESET pulse is received from the control circuitry whenever the user is adjusting the phase setting from the control panel; and (3) when the VIDEO PRESENCE DETECTOR (VPD) pulse is received from the Output Sync Pulse Generator, indicating the timing reference video has been interrupted and reestablished.

The Pulse Former produces pulse "VF", the Vertical Load Pulse used by the Output Sync Pulse Generator (described below), and the Input Sync Pulse Generators and Decoder used for input video and key signal processing.

The PAL Output Sync Pulse Generator: Its purpose is to produce advanced or delayed timing pulses needed by the video, key, and control processing circuitry in the DPM-700 having to do with the "output" or "target" realm of image manipulation. The degree of advance or delay is under user control as part of the set-up procedure and allows the DPM-700, as a source device, to be timed to fit into a wide range of studio configurations. The Output Sync Pulse Generator receives the following inputs, all of which come from the DPM-700's timing circuitry just described:

- SPGRST: derived from VF and bus data
- F1OUT, F2OUT, and F3OUT: field data
- CLK (the system clock) from the VCX Oscillator

The Output Sync Pulse Generator, under user control, advances or delays the operation of the following circuits: (1) the control subsystem's CPUs, (2) the Reverse-Address Generator (RAG) and Recursive Memory (option) as to when video and key data will be read out of memory, (3) video and key signal output processing (digital-to-analog conversion) and final (external background) keying, and (4) output crosshair (cursor) generation. The Output Sync Pulse Generator maintains the same color framing field as that of the timing reference signal. Listed are the Output Sync Pulse Generator's outputs:

- KEY_ADV_CB (Keyer Advanced Composite Blanking) is sent to the Analog Keyer (on this module) and used to compensate for output timing adjustments when the DPM-700 is operating in the upstream mode relative to a production switcher.
- FID (Field Identification) marks the beginning of each field and is used to synchronize the entire control subsystem, including the control panel In

this role, it tells the CPU when to transmit video/key hardware parameters (at the start of the vertical interval): It also synchronizes the video and key signal processing circuits, for example, the output side of the Transform Subsystem's RAM governed by the Reverse-Address Generator. FID also drives the Output Vertical Pulse Generator (detailed below).

- H/2 (Horizontal over 2) goes to the Sync-Burst Adder in the output processing section of the Interface Module; used to define the proper phase of burst for reconstructing the composite video waveform.
- CS (Composite Sync) also goes to the Sync Burst Adder and defines the correct location of sync.
- ADV_CB (Advanced Composite Blanking) is used to generate KEY_AD_CB (Key Advanced Composite Blanking), a timing signal for key path blanking.
- CB (Composite Blanking) also goes to the Sync Burst Adder and defines the standard composite blanking interval; does not contain sync and burst.
- VD (Vertical Drive) also goes to the Sync Burst Adder and defines where the vertical interval begins.
- VPD (Video Presence Detector) goes back to reset the SC/H Tracker when the timing reference video is reestablished after an interruption; VPD also goes to the control system so that it can display a message on the control panel that the timing reference has been interrupted.
- CPDAC (Clamp Pulse for Digital-to-Analog Conversion): a backporch clamp, for the DAC filter, used for dc-level restoration during output processing; also known as the sampling pulse.

The PAL Output Horizontal and Vertical Pulse Generator has two outputs with the following functions:

- OH (Output Horizontal): for all video/key hardware after the Transform Image RAM (target space); used along with pulse OV (below) to determine when the Reverse-Address Generator reads data out of memory.
- OV (Output Vertical): for all video/key hardware after the Transform Image RAM (target space); used along with pulse OH (above) to determine when the Reverse-Address Generator reads data out of memory.

PAL Input Sync Pulse Generator (Ch. 1): Allows independent advance or delay of timing circuitry dealing with the input or "source space" realm of the DPM-700. It provides the user much flexibility in timing his input video and key sources to the particular system involved. This circuit operates very much like the Output Sync Pulse Generator circuitry and allows input timing settings to be stored on and loaded from disk. This circuit consists of the Ch.1 Sync Pulse Generator and the Horizontal and Vertical Pulse Generator. (The design for Ch. 2 is the same as that for Ch. 1.) Its outputs and their functions follow:

- IH1 (Input Horizontal Ch. 1): a timing signal for the Transform Image RAM via the Write-Address Generator, i.e., when data is written into memory.
- CP1A (Clamp Pulse Channel 1): a sync-tip clamp for rejecting hum during sampling on the input submodule.
- CP1ADC (Clamp Pulse Channel 1 for Analog-to-Digital Conversion): this backporch clamp puts the signal at the proper level for proper sampling by the ADC.
- V_RST_1 (Vertical Reset Ch. 1): for controlling input resolution improvement memory on Input Submodule.
- IV1 (Input Vertical Ch. 1): to input side of Transform RAM; a timing signal for the Write-Address Generator; used to define active video interval.

PAL Input Sync Pulse Generator (Ch. 2): Consists of Ch.2 Sync Pulse Generator and the Horizontal and Vertical Pulse Generator. (The design for Ch. 1 is the same as that for Ch. 2.) Its outputs and their functions follow:

- IH2 (Input Horizontal Ch. 2): a timing signal for the Transform Image RAM via the Write-Address Generator, i.e., when data is written into memory
- CP2A (Clamp Pulse Channel 2): a sync-tip clamp for rejecting hum during sampling on the input submodule
- CP2ADC (Clamp Pulse Channel 2 for Analog-to-Digital Conversion): this backporch clamp puts the signal at the proper level for proper sampling by the ADC
- V_RST_2 (Vertical Reset Ch. 2): for controlling input resolution improvement memory on Input Submodule
- IV2 (Input Vertical Ch. 2): to input side of Transform RAM; a timing signal for the Write-Address Generator; used to define active video interval.

The PAL Crosshair Generator: This circuit consists of the Horizontal Counter, Vertical Counter, and Crosshair Generator itself, used to produce the Crosshair Fill Video (CHF), the Crosshair Key signal (CHK), and the Not Crosshair Key signal (/CHK). These three outputs are sent to the Crosshair Inserter in the output processing stage of the Interface Module, following the final Keyer and Fade-to-Black Mixer. The Crosshair Generator's counters count down from a control value, which comes from the microprocessor, to zero, resulting in H_TRIG (Horizontal Trigger) and V_TRIG (Vertical Trigger). These define where the starting point for each channel's crosshair key should be for each field. The fill pattern is selectable and is separate for the two channels.

Section 5
Maintenance

INTRODUCTION

This section of the manual includes maintenance, troubleshooting, and adjustment information for servicing the DPM-700. Topics covered include the following:

- Safety Precautions—Important information you should know before servicing the DPM-700.
- Reference Information—where to find other information you may need in order to maintain the unit, and orientation to basic system components.
- Routine Maintenance—How to clean the air filters, replace pushbutton lamps, replace fuses, and clean interior and exterior parts.
- Troubleshooting—Preliminary checks, troubleshooting the control, video, and key paths, system block diagram.
- Repair and Replacement Instructions—How to obtain replacement parts, how to service the power supply, how to disassemble and reassemble the control panel and electronics frame.
- Adjustments—how to use the optional module extenders, how to adjust the system if you replace parts.
- How To Use The System Software and Diagnostic Software Disks

SAFETY PRECAUTIONS

Please read "Important Safeguards and Symbols" in the front of this manual and all of the following precautions thoroughly before working on the DPM-700. They are meant to protect you and the equipment.

WARNINGS

Lethal (deadly) levels of electricity are present inside the electronics frame behind the protective cover that contains the ON/OFF power switch. To prevent injury or death from electric shock, refer all work that requires removing this protective cover or the frame top cover to qualified service personnel only.

To prevent injury or death due to electric shock, disconnect the ac power cord before you remove the frame top cover or the protective front cover that contains the ON/OFF power switch.

To prevent injury or death due to electric shock, ensure that the ground (earth) conductor in the ac power connector (center conductor) is connected to a proper earth ground. Also, if the ac power cord becomes damaged in any way, replace it immediately.

CAUTIONS

Equipment damage may result if the wrong ac voltage is selected at the ac power input connector. Be sure to select the correct voltage before applying ac power. Correct selections are 120 for ac power that is 90 - 132 volts and 220 for ac power that is 180 - 264 volts.

Connectors may be damaged by electrical arcing if they are connected or disconnected with power on. To prevent connector damage, always turn off system power before you install or remove circuit boards or make connections to the DPM-700. The module restrict bar on the front of the frame should always be in place when power is on to prevent careless removal of modules.

Equipment damage can result if electronic components inside the DPM-700 are exposed to static discharge. To prevent static damage, ensure that your body and the equipment are both grounded before handling any circuit boards.

Equipment damage may result if the continuous flow of cooling air to the equipment is blocked. To prevent heat damage from insufficient air flow, be sure that the air vents on the right side and front of the electronics frame are not obstructed, and be sure to allow one rack unit of empty space above and below the frame. Also ensure that the internal cooling fans are continuously operating when power is on by checking that high-velocity air is flowing out of the right side of the frame.

Equipment damage from electrical shorts may result if liquids get inside any of the system's electronic components. To prevent damage, do not permit any liquids to get into the equipment.

REFERENCE INFORMATION

The following text explains where to find additional information that may be needed in order to maintain or troubleshoot the DPM-700.

How To Obtain Service

Service is provided by the distributor who sold you your DPM-700. For all of your service needs, including repairs covered by the two-year warranty, please consult with the distributor first. If you need additional service help, you may reach Grass Valley Group, Professional Video Division Customer Service at the following telephone number: (916) 478-3359.

Please locate the serial number on the DPM-700 frame and/or panel and be ready to give the number to Customer Service when you call.

Adjustments

The DPM-700 and its options come from the factory fully tested and aligned. Similarly, any replacement modules ordered from the factory come fully aligned. No special installation or alignment is necessary other than that which is described in the Installation section of this manual. If you choose to make adjustments to the unit, please refer to the Adjustments information near the end of this section.

Change Information

Changes to the system that have occurred since this manual was written are documented in the Change Information section following the Parts Lists section. Very recent changes are packaged in an envelope which is inserted inside the front cover of this manual when it is shipped.

Replacement Parts Lists and Drawings

Replacement parts lists, schematic diagrams, and other reference drawings are included in the last three sections of this manual.

Assembly Numbers and Interchanging Parts

Grass Valley Group modules and assemblies are identified by an assembly number (for example, 064700-00A) and a name which are placed on the assembly either on a sticker or by silkscreening. Please use this number whenever you order replacement parts.

The first six digits of the number identify the type of assembly, the two digits following the dash indicate the version (major revision) of the assembly, and a letter at the end identifies the issue (minor revision). Assemblies must have the same base number and version number in order to be interchangeable.

System Orientation

To help orient you to basic information about the DPM-700, Figures 5-1 and 5-2 show the locations of major components in the system. The DPM-700 consists of a control panel and a rack-mounted electronics frame which contains the video, power, and microprocessor modules. The single cable connecting the frame to the panel carries both data and dc power for the panel.

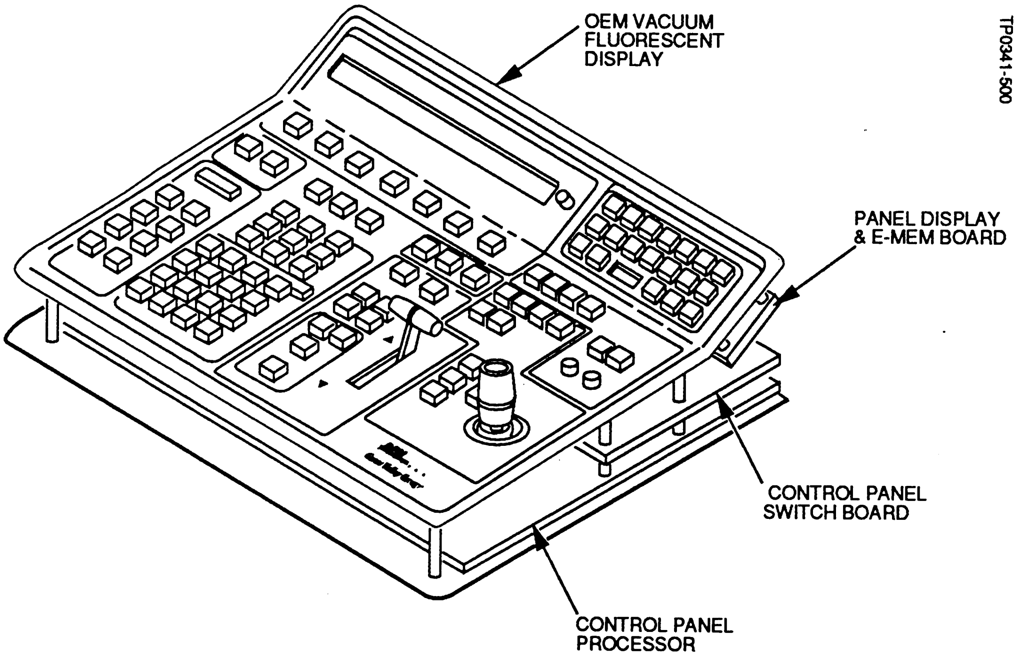

OEM VACUUM FLUORESCENT DISPLAY
TP0341-500
PANEL DISPLAY & E-MEM BOARD
CONTROL PANEL SWITCH BOARD
CONTROL PANEL PROCESSOR

Figure 5-1. Control Panel Module Locations

CAUTION

BEFORE REMOVING OR INSERTING A MODULE, TURN OFF THE POWER. TO PREVENT STATIC DAMAGE TO PARTS, BE SURE YOU ARE GROUNDED BEFORE YOU TOUCH A MODULE

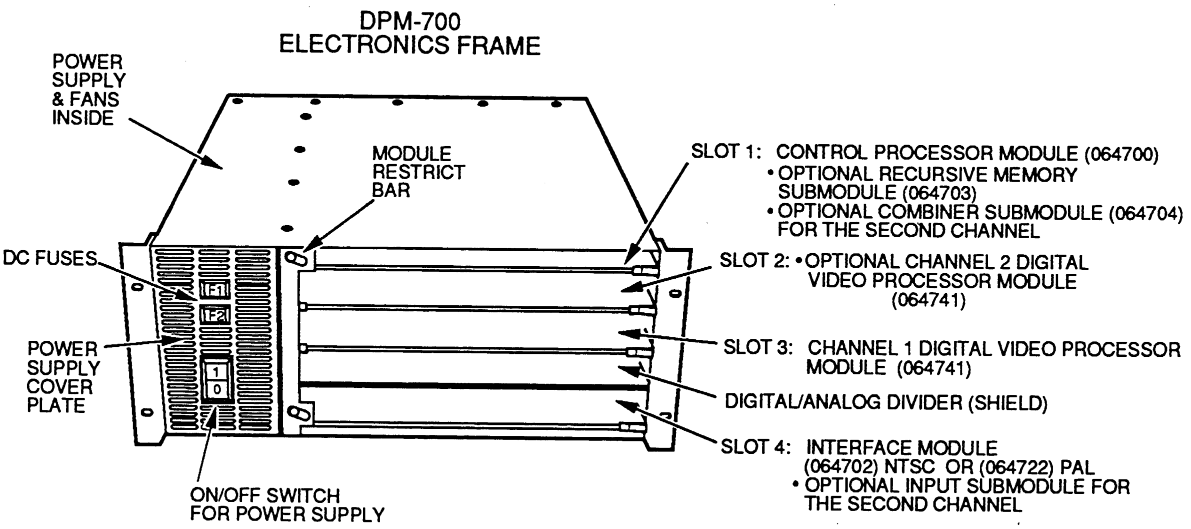

TP341-202
DPM-700
ELECTRONICS FRAME
POWER SUPPLY & FANS INSIDE
MODULE RESTRICT BAR
DC FUSES
F1
F2
POWER SUPPLY COVER PLATE
1
0
ON/OFF SWITCH FOR POWER SUPPLY
SLOT 1: CONTROL PROCESSOR MODULE (064700)
• OPTIONAL RECURSIVE MEMORY SUBMODULE (064703)
• OPTIONAL COMBINER SUBMODULE (064704) FOR THE SECOND CHANNEL
SLOT 2: • OPTIONAL CHANNEL 2 DIGITAL VIDEO PROCESSOR MODULE (064741)
SLOT 3: CHANNEL 1 DIGITAL VIDEO PROCESSOR MODULE (064741)
DIGITAL/ANALOG DIVIDER (SHIELD)
SLOT 4: INTERFACE MODULE (064702) NTSC OR (064722) PAL
• OPTIONAL INPUT SUBMODULE FOR THE SECOND CHANNEL

Figure 5-2. Electronics Frame Module Locations

ROUTINE MAINTENANCE

Information included under this heading explains how to perform the maintenance functions that the DPM-700 may need on a regular or routine basis.

Electronics Frame Intake Air Filter Cleaning

The intake air filter in the front cover of the electronics frame is a vital part of the cooling system for the DPM-700. It is essential that the filter be kept clean so as to provide a continuous flow of cooling air to the system. If it is not kept clean and cooling air is obstructed, the system may overheat, causing internal damage.

We recommend that you remove the front cover and check the filter at least monthly. It is attached using velcro strips and can be removed as shown in Figure 5-3 by grasping it firmly with your fingers and pulling it away from the cover. Wash the filter in a mild detergent and water solution and let it dry completely before re-installing it.

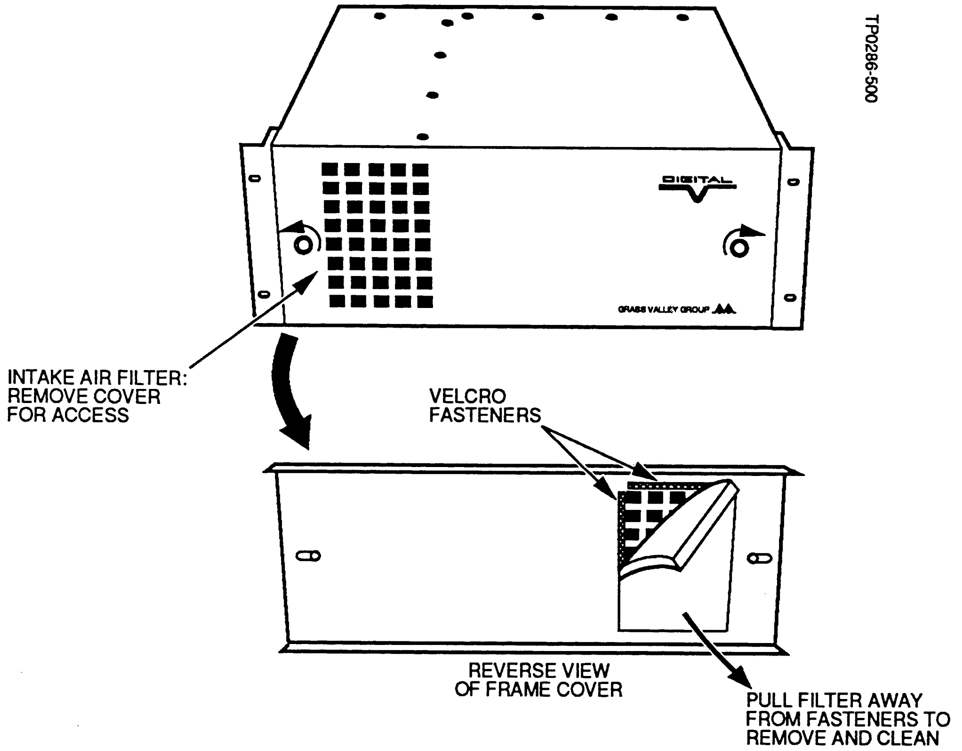

TP0286-500
DIGITAL
GRASS VALLEY GROUP
INTAKE AIR FILTER:
REMOVE COVER
FOR ACCESS
VELCRO
FASTENERS
REVERSE VIEW
OF FRAME COVER
PULL FILTER AWAY
FROM FASTENERS TO
REMOVE AND CLEAN

Figure 5-3. Intake Air Filter Removal For Cleaning

Pushbutton Lamp Replacement

Lamps inside the control panel pushbuttons will burn out occasionally and require replacement. To replace a lamp, refer to Figure 5-4 and proceed as follows:

1. Grasp the pushbutton cap firmly between your fingers and pull it straight up and out of the panel.
2. Remove the lamp by pulling it straight up with a pair of needle-nosed pliers.
3. Insert a replacement lamp and replace the pushbutton cap. Spare lamps can be found inside the pushbuttons that do not light, such as the Direct Entry numeric keypad, and also in the Spare Lamp and Fuse Kit shipped with the system.

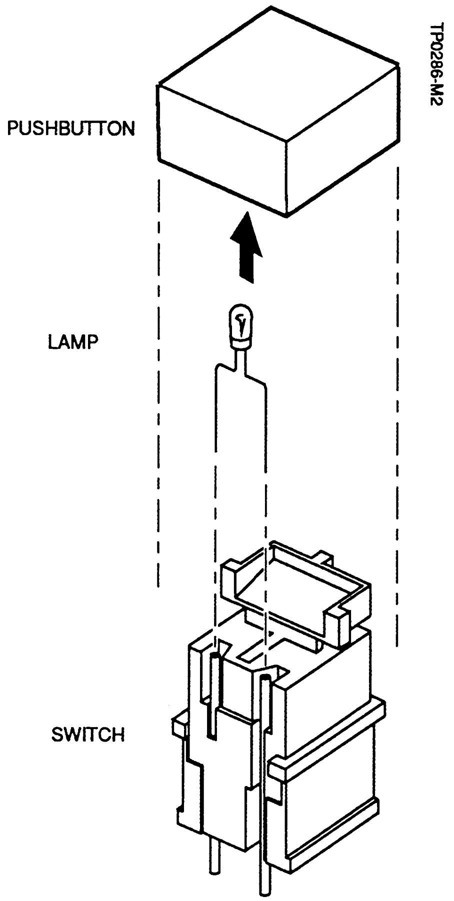


Figure 5-4. Pushbutton Lamp Replacement

Fuse Replacement

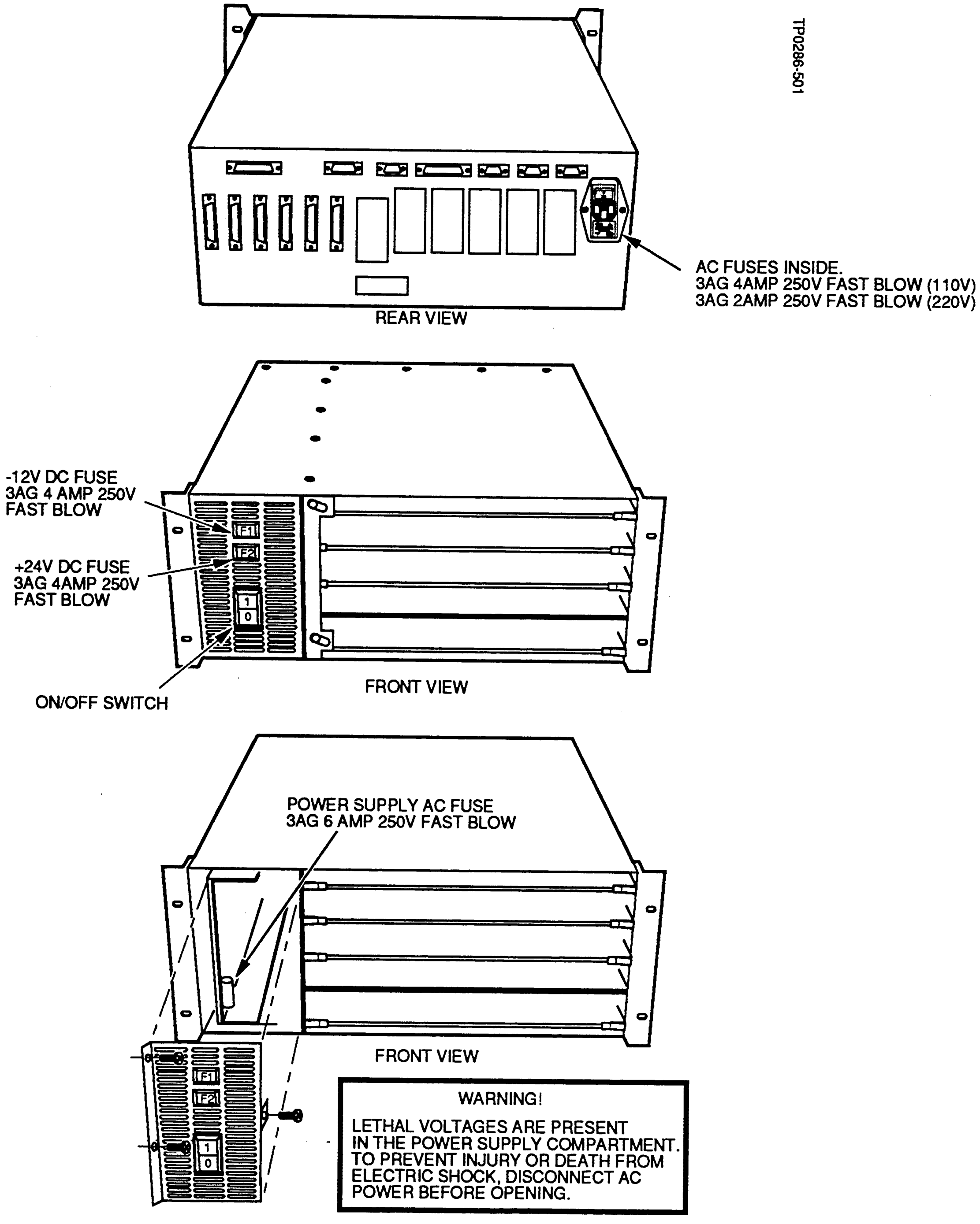
There are 4 fuses in the frame and none in the control panel. Fuse replacement instructions are given on the following pages. Refer to Figure 5-5 for fuse locations. Spare fuses are included in the Spare Lamp and Fuse Kit shipped with the system.

CAUTION

Before replacing any blown fuses, always search the equipment to find what caused the fuse to blow, looking especially for hot or burned components. If you fail to correct the trouble before you replace the fuse, the equipment may be damaged when you reconnect the power.

WARNING

Lethal (deadly) voltages are present at the ac fuse holders, and dangerous voltages are present at the dc fuse holders. To protect yourself from death or injury by electric shock and to protect the equipment from possible short circuits, always disconnect power at the ac input connector before changing any fuses.


TP0286-501
AC FUSES INSIDE.
3AG 4AMP 250V FAST BLOW (110V)
3AG 2AMP 250V FAST BLOW (220V)
REAR VIEW
-12V DC FUSE
3AG 4 AMP 250V
FAST BLOW
+24V DC FUSE
3AG 4AMP 250V
FAST BLOW
F1
F2
1
0
ON/OFF SWITCH
FRONT VIEW
POWER SUPPLY AC FUSE
3AG 6 AMP 250V FAST BLOW
FRONT VIEW

WARNING!

LETHAL VOLTAGES ARE PRESENT IN THE POWER SUPPLY COMPARTMENT. TO PREVENT INJURY OR DEATH FROM ELECTRIC SHOCK, DISCONNECT AC POWER BEFORE OPENING.

Figure 5-5. Fuse Locations

AC Line Fuse Replacement

The ac line fuses are located inside of the ac power connector on the back of the electronics frame. To replace the fuses, refer to Figure 5-6 and proceed as follows:

1. Disconnect the ac power cord.
2. Insert a small flat-blade screwdriver into the slot at the top of the fuse drawer and pry the door open. Remove the drawer from the assembly.
3. As you hold the fuse drawer with the front facing you, the correct voltage range for your application should be in the lower right corner. The correct value fuse will be inserted into the holder on the left side of the drawer.
4. Select the proper value of fuse for your application:
    - 2 amp 250V for 220-240V
    - 4 amp 250V for 110-120V

   Make sure the fuse is intact and in good condition.
5. Slide the fuse lock out of the left side of the fuse drawer, insert the fuse into the fuse holder, and slide the fuse lock back in place.
6. With the correct voltage range in the lower right corner, insert the fuse drawer into the receptacle assembly. The front should be flush with the assembly.

CAUTION

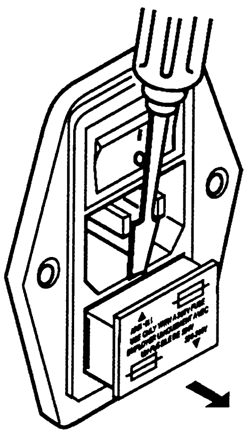
Be sure the correct ac line voltage is selected before you reconnect the ac power cord. If the wrong voltage is selected, damage to the equipment may occur when power is connected.

7. Reconnect the ac power cord.

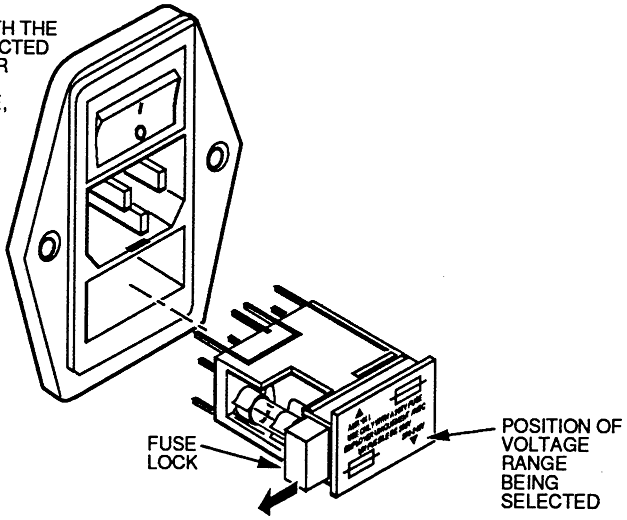
CAUTION
INCORRECT LINE VOLTAGE SELECTION CAN CAUSE DAMAGE TO THE EQUIPMENT

TO CHANGE THE LINE VOLTAGE SELECTION, PROCEED AS FOLLOWS:

1. USE A SMALL FLAT-BLADE SCREWDRIVER TO PRY OPEN THE FUSE DRAWER OF THE AC POWER CONNECTOR.
2. SLIDE THE FUSE DRAWER OUT OF THE AC POWER CONNECTOR.



3. HOLD THE FUSE DRAWER WITH THE VOLTAGE RANGE TO BE SELECTED IN THE LOWER RIGHT CORNER (POINTING DOWN). SLIDE THE FUSE-LOCK AT THE LEFT SIDE, OUT OF THE FUSE DRAWER.


FUSE LOCK
POSITION OF VOLTAGE RANGE BEING SELECTED

4. INSERT THE CORRECT VALUE FUSE INTO THE FUSE HOLDER AT THE LEFT, FUSE-LOCK END FIRST AND CLOSE THE FUSE LOCK.
5. WITH THE PROPER VOLTAGE RANGE IN THE LOWER-RIGHT CORNER, INSERT THE FUSE DRAWER INTO THE AC POWER CONNECTOR. THE FUSE SHOULD BE ON THE LEFT AND THE ARROW FOR THE VOLTAGE RANGE BEING SELECTED SHOULD POINT DOWN.
6. CONNECT THE POWER CORD.

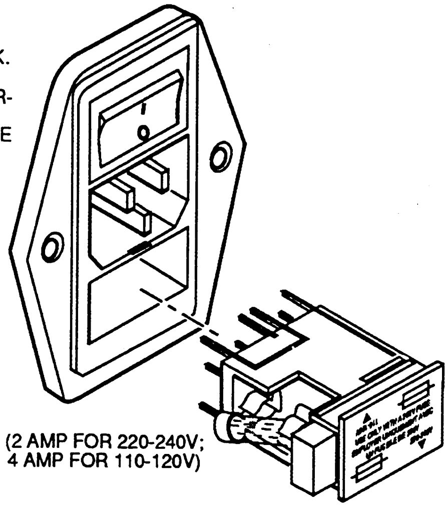

(2 AMP FOR 220-240V;
4 AMP FOR 110-120V)

Figure 5-6. AC Line Fuse Replacement

DC Fuse Replacement

Fuses for the -12 volt and +24 volt raw dc power supplies are located inside the front cover of the electronics frame above the ON/OFF power switch. To remove these fuses, push in and down on the front of the fuse holder, and the fuse will pop out. Replace the dc fuses with the following fuse values:

-12 volts: 3AG, 4 Ampere Fast Blow, 250V
+24 volts: 3AG, 4 Ampere Fast Blow, 250V

Power Supply Internal AC Fuse Replacement

The OEM power supply module inside of the electronics frame contains its own ac fuse. To check or replace this fuse, refer to the instructions given under the heading How To Service The Power Supply later in this section. The correct fuse value is silkscreened on the Power Supply pc board and is also listed below:

90 - 132 Vac: 3AG 6 amperes 250V Fast Blow
180 - 230 Vac: 3AG 3 amperes 250V Fast Blow

WARNING

Lethal (deadly) voltages are present inside the electronics frame. Do not remove the frame's protective switch cover or top cover to work on the power supply unless you are technically qualified. To protect yourself from death or injury by electric shock, disconnect the ac power cord before opening the frame.

Cleaning

The control panel surface may be wiped off with a damp cloth from time to time, but do not use any harsh cleaners which may damage the plastic laminated surface of the panel. No other surfaces of the equipment should require any cleaning other than the intake air filter described earlier in this section.

TROUBLESHOOTING

If the DPM-700 appears to develop operating or functional problems, the following troubleshooting procedure may help you to isolate the cause. For best results, always start with check number 1 and work through the checks in numerical sequence.

Preliminary System Checks

The following are simple checks you should make before going on to more complex problem analysis. Very often, problems are the result of the simple faults described below. Perform these checks in the order in which they're given.

1. Check Control Settings

A. Check the position of each of the controls for the function you are using, and verify what correct operation should be using the Operator's Guide before assuming that there is a software or hardware fault. With an operationally complex device such as the DPM-700, apparent functional problems may be the result of a misadjusted panel control.

B. Check system timing if you are experiencing timing problems, such as unsynchronized (jumpy) or color-shifted video. Since timing is adjustable at the control panel, it is possible that someone has left the timing misadjusted. Also, make sure that your reference sync input is stable. (Refer to the Installation section for system timing instructions).

If the timing is set correctly and the reference input is stable but the video is still unsynchronized, the timing circuits on the Interface Module may be faulty.

2. Check Connections and Related Equipment

A. If the unit does not appear to respond to some or all control panel operations, check that the cable between the frame and the control panel is properly connected. Similarly, if editor control is lost, check the cable between the editor and the DPM-700 electronics frame.

B. Also check that all of the modules in the DPM-700 frame are properly seated in their cells. The modules must mate with the connectors inside the back of the frame. Firmly push the modules toward the back to ensure that they are making good contact with the connectors. Check that submodules are installed and connected properly also.

C. If a single video or key input or output is lost, check the associated input or output cable. In the case of inputs, also check the equipment where the signal originates.

3. Turn Power Off and On And Check Indicators

Reset the microprocessors by turning the power switch off and then on again. The power switch is located on the left front of the frame behind the front cover. ***NOTE:*** *Turning power off will cause you to lose your current control panel settings. The system will power up to its default state. To save your current settings, use the {Disk} menu in the STREAMLINE® Display.*

The green indicators (CD0 - CD7 and TD0 - TD7) on the front of the frame Control Processor Module should light in sequence and then all turn off as the system goes through its power-up self-diagnostics. The LEDs function in three modes: Boot-up; Program Transfer; and System Running. The individual LED functions are given in Table 5-1. After the system has finished powering up, the panel should be in the default state shown in Figure 5-7.

If one of the green D0 - D7 indicators stays on or the panel does not power up in the default state, a problem with the Frame Control Processor Module is likely. If the system powers up in the correct default state and the indicators in the frame are off but the problem persists, continue with the following checks.

4. Check Fuses

There are four (4) fuses in the frame and none in the control panel. Three of these fuses (the ac fuse inside the main power connector and the two dc fuses above the power switch) are easily accessible and should be checked now. The fourth fuse, which is an ac fuse inside the power supply, is difficult to reach and needs

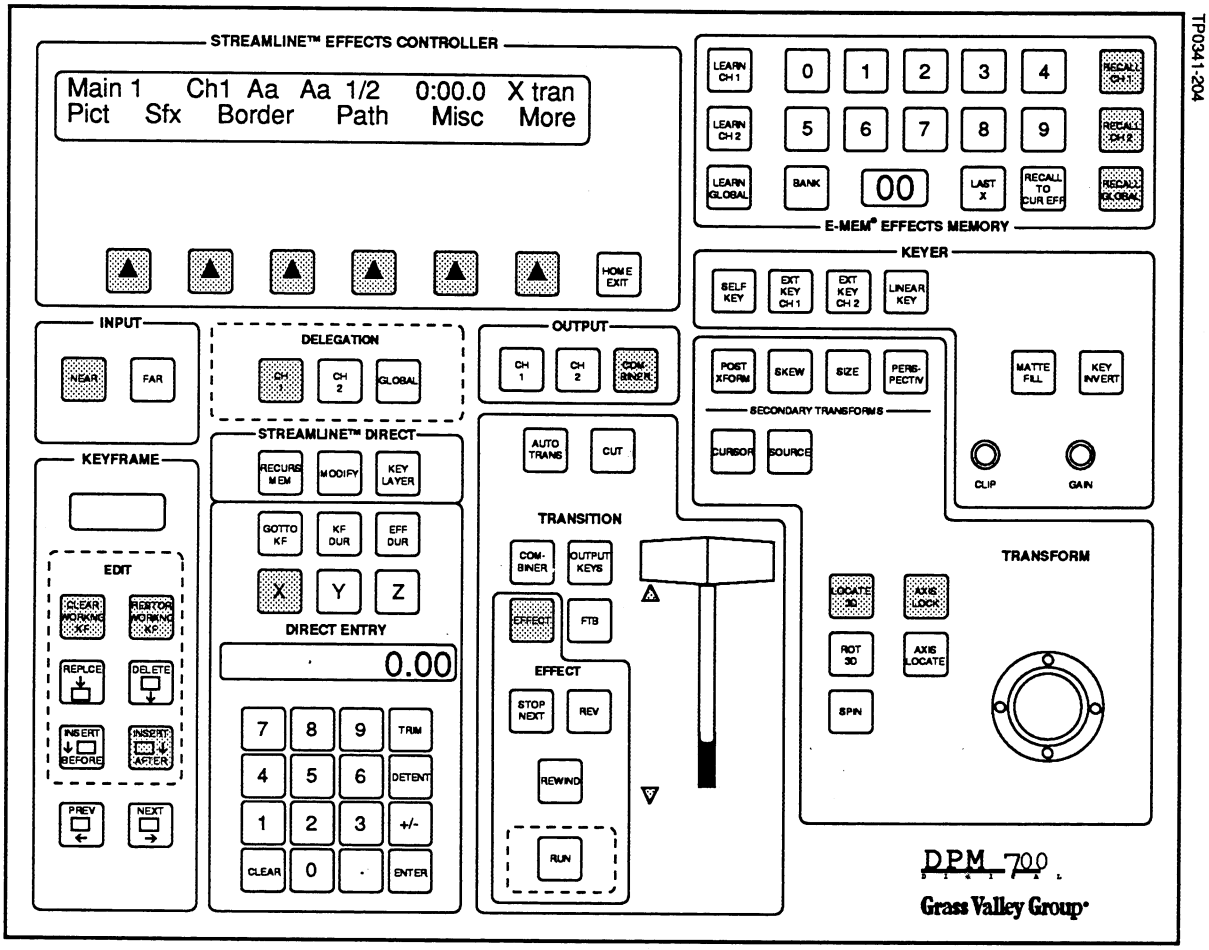

STREAMLINE™ EFFECTS CONTROLLER
Main 1 Ch1 Aa Aa 1/2 0:00.0 X tran
Pict Sfx Border Path Misc More
HOME EXIT
LEARN CH 1
LEARN CH 2
LEARN GLOBAL
0
1
2
3
4
5
6
7
8
9
BANK
00
LAST X
RECALL TO CUR EFF
RECALL CH 1
RECALL CH 2
RECALL GLOBAL
E-MEM® EFFECTS MEMORY
TP0341-204
KEYER
SELF KEY
EXT KEY CH 1
EXT KEY CH 2
LINEAR KEY
INPUT
NEAR
FAR
DELEGATION
CH 1
CH 2
GLOBAL
OUTPUT
CH 1
CH 2
COM-BINER
POST XFORM
SKEW
SIZE
PERS-PECTIV
SECONDARY TRANSFORMS
CURSOR
SOURCE
MATTE FILL
KEY INVERT
CLIP
GAIN
STREAMLINE™ DIRECT
RECURS MEM
MODIFY
KEY LAYER
KEYFRAME
EDIT
CLEAR WORKING KF
RESTOR WORKING KF
REPLCE
DELETE
INSERT BEFORE
INSERT AFTER
PREV
NEXT
GOTTO KF
KF DUR
EFF DUR
X
Y
Z
DIRECT ENTRY
0.00
7
8
9
TRIM
4
5
6
DETENT
1
2
3
+/-
CLEAR
0
.
ENTER
AUTO TRANS
CUT
TRANSITION
COM-BINER
OUTPUT KEYS
EFFECT
FTB
EFFECT
STOP NEXT
REV
REWIND
RUN
TRANSFORM
LOCATE 3D
AXIS LOCK
ROT 3D
AXIS LOCATE
SPIN
DPM 700 DIGITAL
Grass Valley Group®

Figure 5-7. Control Panel Default State

to be checked only if the other three fuses are ok and the system has completely lost all power (no video out and no lights on). This fourth fuse should be checked only by qualified service technicians because of the danger of electric shock. Refer to the text that explains Fuse Replacement earlier in this section for specific instructions.

5. Check Power

Before making any video or control system checks, verify that all required dc voltages are present in the frame. An apparent video or control system problem may actually be caused by a low or missing dc voltage.

A. Check Frame DC Voltages: The following voltages are used in the frame: +5V, +10V, -10V, and -5.2V. Check the voltages at each of the test points on the front of the 702 Analog I/F Module. Locations of test points are shown in Figure 5-8. These voltages should be within approximately 0.05V of the nominal voltage. If any of the voltages are low, refer to the Adjustments heading later in this section for instructions about how to adjust the power supply. If any voltages are missing, go to step B. If you don't find any power faults, go on to step C.

B. Locate Frame Power Problems: If one or more of the voltages is not present, the power supply may be in foldback because of a short in the system, or the power supply may be faulty. To determine if the problem is a shorted module, monitor the problem test point and then disconnect one module at a time from the frame to see if the voltage returns to the test point. Disconnect the control panel as part of this test also. Observe the following precautions:

- Be sure to turn system power off before you remove or plug in a board to prevent damage to the connectors.
- The power supply must be under a partial load in order to operate properly, so don't remove all the modules at one time; this will cause the power supply to produce no output.

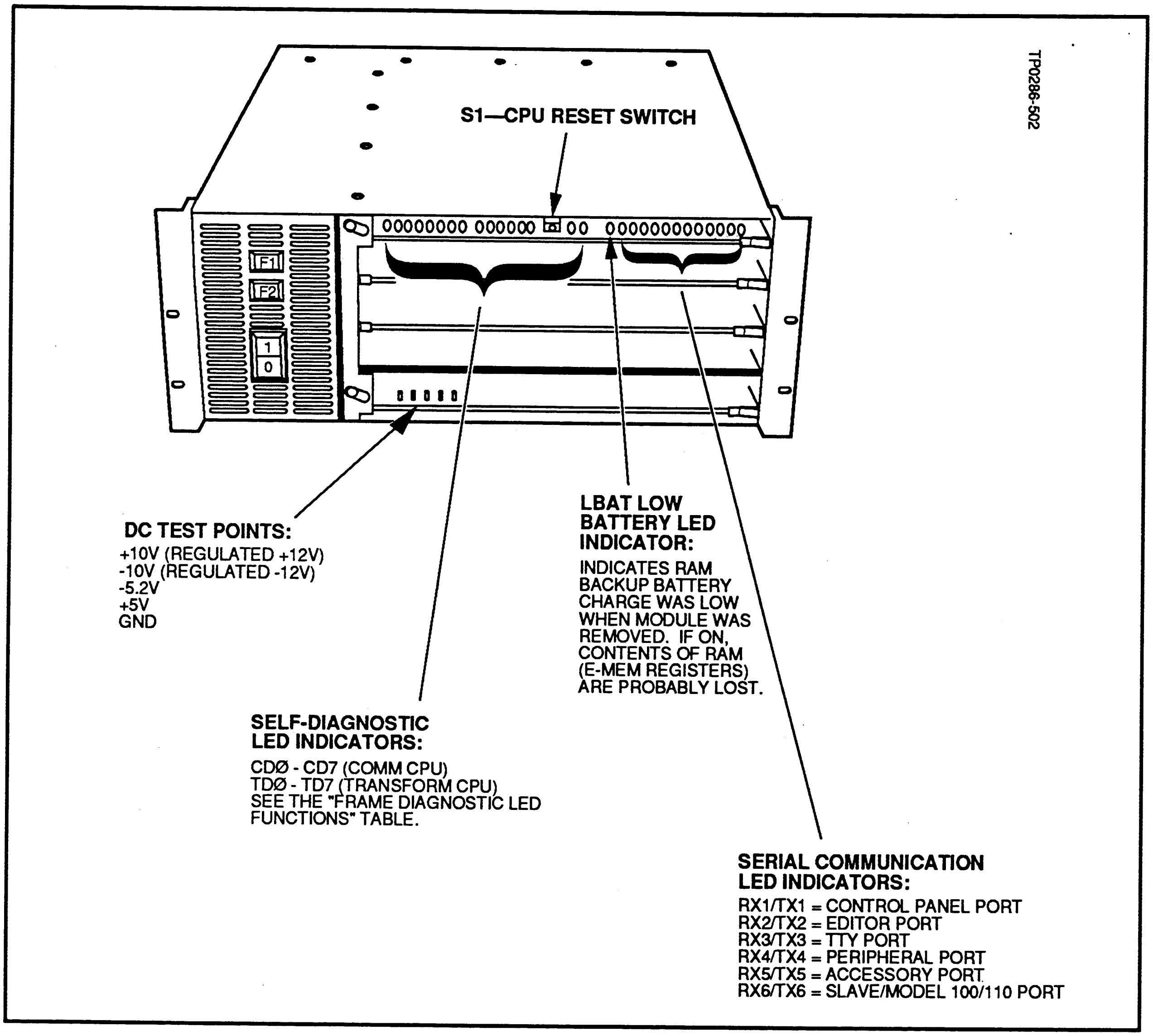
If the voltage at the problem test point returns to normal when a particular module (or the control panel) is removed, the short is on that module. If you don't find any faulty modules, the power supply, its wiring harness, or the mother boards may be at fault; refer to the explanation of How To Service The Power Supply later in this section for information about checking the power supply. To check the motherboards, you will have to use a continuity checker and the System Interconnect Drawing in the Drawing section of this manual to locate and check the power signal path for continuity.

C. Check Control Panel DC Voltages: You need to check control panel power only if the preceding test indicated a power short in the panel or if some or all portions of the panel do not appear to be operating properly (pushbuttons that don't light, disk drive not working, displays not working, etc.).

Refer to Figure 5-9 for the locations of the panel test points; check them to see if the correct voltages are present (To access the test points, which are inside of the panel, refer to the Control Panel Disassembly instructions later in this section). If the correct dc voltages are not present at all test points, go on to step D; otherwise go on to step 6.

D. Locate Panel Power Problem: The panel is powered by +24V and -12V from the frame power supply, which sends the voltages to the panel through the frame-to-panel cable. The -12V supply is used directly as the reference voltage for the A-D converter for the analog potentiometers. The +24V supply is further regulated on the Panel Control Processor Module to create two +5V supplies and one +12V supply. One of the +5V supplies powers the panel lamps, and the other powers the microprocessor. The +12V supply powers the disk drive.

Possible causes for absent voltages are a bad cable or connection from panel to frame, a faulty frame power supply, bad regulator(s) on the Panel Control Processor, bad connections between panel modules, or a short on a panel board.



DC TEST POINTS:
+10V (REGULATED +12V)
-10V (REGULATED -12V)
-5.2V
+5V
GND

LBAT LOW BATTERY LED INDICATOR:
INDICATES RAM BACKUP BATTERY CHARGE WAS LOW WHEN MODULE WAS REMOVED. IF ON, CONTENTS OF RAM (E-MEM REGISTERS) ARE PROBABLY LOST.

SELF-DIAGNOSTIC LED INDICATORS:
CD0 - CD7 (COMM CPU)
TD0 - TD7 (TRANSFORM CPU)
SEE THE "FRAME DIAGNOSTIC LED FUNCTIONS" TABLE.

SERIAL COMMUNICATION LED INDICATORS:
RX1/TX1 = CONTROL PANEL PORT
RX2/TX2 = EDITOR PORT
RX3/TX3 = TTY PORT
RX4/TX4 = PERIPHERAL PORT
RX5/TX5 = ACCESSORY PORT
RX6/TX6 = SLAVE/MODEL 100/110 PORT

Figure 5-8. Frame DC Test Points and LED Indicators

Table 5-1. Frame Diagnostic LED Functions

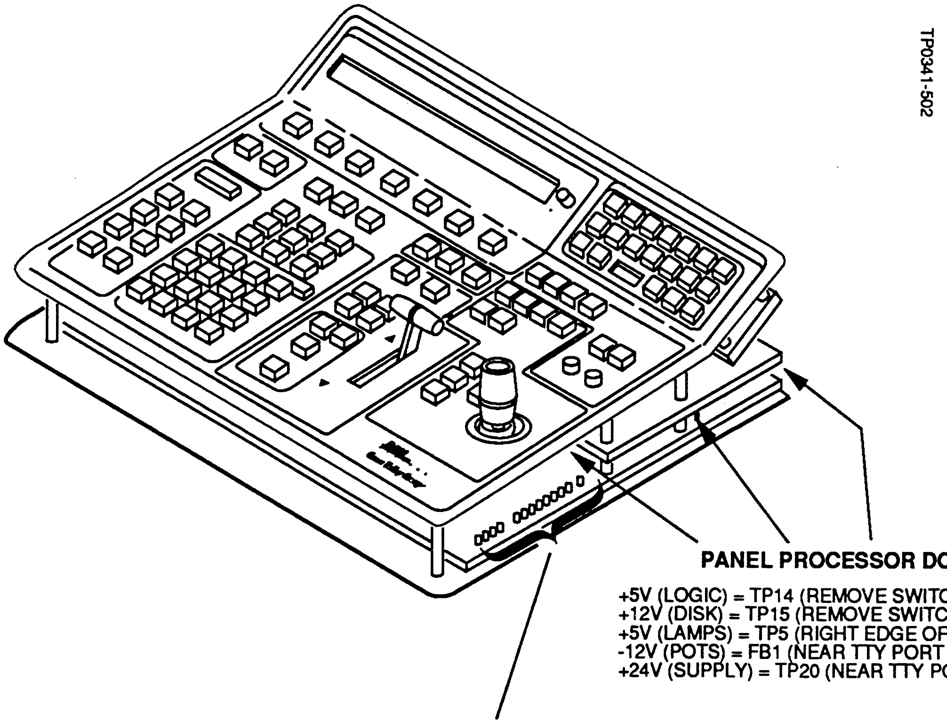
LED	BOOT-UP	EEPROM to RAM Txfr	SYSTEM RUNNING
CD0	RAM Test	Check For Valid Program Header	Background
CD1	UART Test	Transfer Program Text	Field Interrupt
CD2	DMA Test	Transfer Program Data	
CD3	Dual Port RAM Test	Transfer Prog. Header	
CD4	Tests completed		Editor Protocol Rcvr (except CONTROL PANEL or TTY ports)
CD5			Control Panel Uart Tx
CD6			Control Panel Uart Rx
CD7	Error		
TD0	RAM Test	CPU inactive	Background
TD1	no test	"	Field Interrupt
TD2	no test	"	
TD3	Dual Port RAM Test	"	
TD4	Tests completed	"	
TD5		"	
TD6		"	
TD7	Error	"	

Table 5-2. Panel Diagnostic LED Functions

LED	BOOT-UP	EEPROM to RAM txfr	SYSTEM RUNNING
DS2	RAM Test	Check For Valid Program Header	Background
DS3	Uart Test	Transfer Program Header	Field Interrupt
DS4	DMA Test	Transfer Program Text	
DS5	Interrupt Controller Test	Transfer Program Data	
DS6	Tests completed		
DS7			Frame Communications Transmit
DS8			Frame Communications Receive
DS9	error		

You can check for shorted boards by disconnecting the ribbon cables to the boards one at a time while you monitor the voltage test point on the Control Processor; if power returns when you disconnect a board, the board has a short.

If +24V and -12V are not reaching the panel, disconnect the frame-to-panel cable and check pins 15 and 6 at frame rear connector J2 for +24V and -12V, respectively. If the voltages are present there but not in the panel, the frame-to-panel cable is bad. If not present, the power supply or frame wiring may be faulty. To check the power supply, refer to the heading How To Service The Power Supply later in this section.



PANEL PROCESSOR DC TEST POINTS:

+5V (LOGIC) = TP14 (REMOVE SWITCH BOARD FOR ACCESS)
+12V (DISK) = TP15 (REMOVE SWITCH BOARD FOR ACCESS)
+5V (LAMPS) = TP5 (RIGHT EDGE OF PROCESSOR)
-12V (POTS) = FB1 (NEAR TTY PORT CONNECTOR J2)
+24V (SUPPLY) = TP20 (NEAR TTY PORT CONNECTOR J2)

LED INDICATORS:

DIAG TX (ON) = DIAGNOSTIC PORT DATA TRANSMITTED
DIAG RX (ON) = DIAGNOSTIC PORT DATA RECEIVED
PNL TX (ON) = PANEL TO FRAME DATA TRANSMITTED
PNL RX (ON) = FRAME TO PANEL DATA RECEIVED
DS2 - DS9 = SEE THE "PANEL DIAGNOSTIC LED FUNCTIONS" TABLE
FLD (BLINKING) = FIELD MARKERS BEING RECEIVED FROM FRAME

Figure 5-9. Control Panel DC Test Points and LED Indicators

Troubleshooting The Control, Video, and Key Paths

If the preceding preliminary system checks did not solve the problem, the following text continues the troubleshooting process by leading you through several system checks that may help you isolate the problem to a specific module, which can then be replaced.

6. Check Control System

The control system consists of the frame Control Processor (computer) module, the Control Bus Interface circuitry which controls the circuits on each module in the frame, and the control panel with its internal Control Processor (computer), switch board, OEM display assembly, and disk drive.

If you are experiencing any of the following problems, the control system may be at fault:

- Multiple problems, such as loss of sync, control panel not operating properly, and noisy or misshaped video, may be caused by a faulty frame Control Processor Module.
- A frozen control panel (no response to any panel functions) may be caused by a faulty panel Control Processor.
- Complete loss of lights and/or switch functions on the panel may be caused by a poor frame-to-panel cable connection or a faulty panel Control Processor Module.
- Loss of some but not all switch functions may be caused by a faulty Control Panel Switch Board or Panel Display & E-MEM Board, depending on which switches are bad.

Performing the following checks may help isolate a control system problem to a specific module.

A. Check Frame Control Processor: If you have not already performed the preceding Check 3, do it now. This check uses the LED indicators in the frame to tell you whether the frame control system is passing its self-diagnostics and booting up properly.

B. Check Control Panel Bootup Diagnostics:

Remove the panel outer cover (refer to the Panel Disassembly Instructions later in this section). Check that the panel DS2 - DS9 LEDs, shown in Figure 5-9 and described in Table 5-2, go through the boot-up routine when you turn power off and on again. After the system is finished booting up, the LEDs on both the panel and frame Control Processors should be off or blinking, but not continuously on. If any of these LEDs are continuously on, the self-diagnostics have found a fault on the Panel Control Processor module.

C. Check Panel-Frame Communication: Locate the RX1 (receive) and TX1 (transmit) LED indicators on the front of the frame Control Processor module and the corresponding indicators on the right side of the Control Processor board inside the panel.

Press some panel pushbuttons or move the joystick or lever arm. All four of the RX and TX indicators should light in both the panel and the frame. This indicates the following: (1) data is being processed by the panel and transmitted to the frame, (2) the frame is receiving the panel data, (3) the frame is processing the data to produce panel status messages and transmitting them back to the panel, and (4) the panel is receiving the status messages from the frame.

If any of the four lights do not light properly, there may be a bad connection between panel and frame, or the Control Processor may be faulty at either end. By analyzing which lights are lighting and which are not, you can determine where the problem lies. The list below summarizes the analysis:

- All lights off = Panel Control Processor not sending. Replace Panel Control Processor
- Panel TX on, RX off; and frame TX and RX off = Bad cable, or frame not receiving. Replace cable, or replace frame Control Processor module.

- Frame TX off, RX on; and panel RX off and TX on = Frame not sending. Replace Frame Control Processor module.

- Panel RX off, all others on = Bad cable, or panel not receiving. Replace cable, or replace Panel Control Processor.

7. Check Video Path

The most common problem with most digital video systems is noise (holes or lines) in the video. The following checks are specifically aimed at locating this type of problem, although they may also help locate other video path problems as well.

The method of testing used below is simply a process of elimination by selecting different effects and viewing them on a monitor to determine whether the circuits corresponding to each effect are operating correctly.

As you perform the following checks, refer to the System Block Diagram, Figure 5-10, to help you understand which modules and circuits you are testing.

A. Check Input Submodule: The Input Submodule, which is mounted on the Interface Module, performs input buffering and Analog-to-Digital conversion for inputs A and B of a single video channel.

Note: *If you have a 2-channel system and both channels are exhibiting the problem, you may want to skip to step D; it is very unlikely that both Input Submodules or both Digital Video Processor Modules are faulty.*

1. At the panel display, select a diagnostic test pattern, such as color bars, and view the test pattern on a monitor connected to the PGM output. The test patterns are generated in the Posterizer circuit block on the Digital Video Processor Module, which means that you are now bypassing the Input Submodule. Does the problem go away when the test pattern is brought up? If so, then the Input Submodule may be faulty. If the prob-

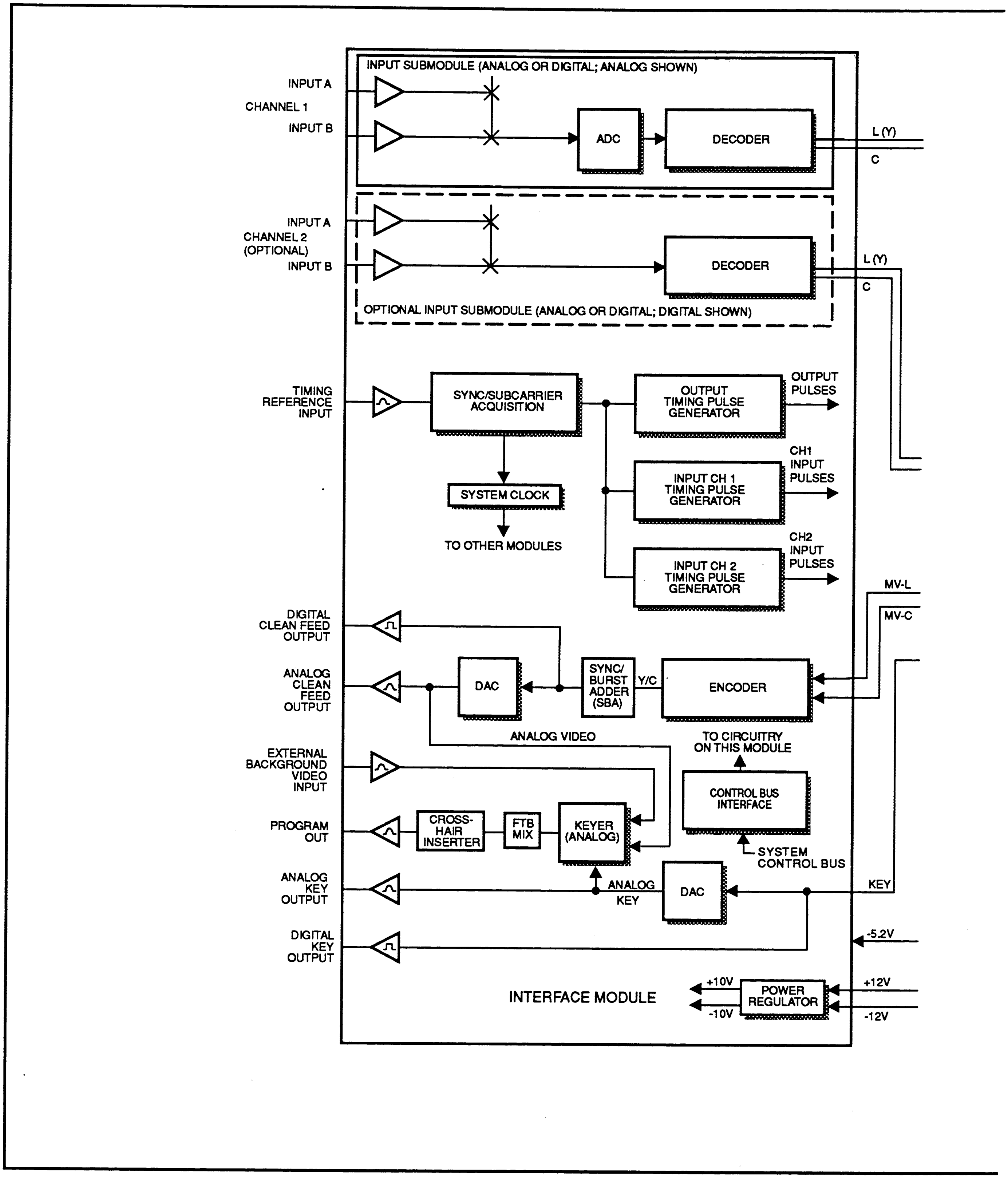
lem did not change, the Input Submodule is probably ok and the problem is somewhere downstream.

2. If you have two channels you can verify a suspected Input Submodule problem as follows: Swap (interchange) the Input Submodules. Does the video problem move to the other channel? If so, the Input Submodule is faulty. If the problem remains in the same channel, go to step C.

C. Check Digital Video Processor Module: The Digital Video Processor Module includes the following circuit blocks: Mosaics/Posterizer/Test Pattern Generator, Border Matte Adder, and all transformation circuits.

Note: *If you have a 2-channel system and both channels are exhibiting the problem, you may want to go to step D; it is very unlikely that both Digital Video Processor modules are faulty.*

1. If you have two channels, swap (interchange) the Digital Video Processor modules. If the problem moves to the other channel, the module is faulty.
2. Compress and rotate the picture. Does the problem compress and rotate with the transformed image? If so, the circuits preceding the transform circuits on the Digital Video Processor are probably at fault. If the problem remains in the entire raster, the fault lies either in the transformation circuits of the Digital Video Processor or somewhere downstream.
3. Create a key using the compressed picture and select [MATTE FILL] (in the KEYER section of the panel). This selects matte as the fill for the compressed picture. If the matte looks ok, the problem is probably in the transformation circuits of the Digital Video Processor. If the matte is bad, the problem occurs after the Digital Video Processor Module. (The matte is generated after the input to the combiner circuits on the Control Processor Module and inserted in place of the transformed video).


INPUT SUBMODULE (ANALOG OR DIGITAL; ANALOG SHOWN)
INPUT A
CHANNEL 1
INPUT B
ADC
DECODER
L(Y)
C
INPUT A
CHANNEL 2
(OPTIONAL)
INPUT B
DECODER
L(Y)
C
OPTIONAL INPUT SUBMODULE (ANALOG OR DIGITAL; DIGITAL SHOWN)
TIMING REFERENCE INPUT
SYNC/SUBCARRIER ACQUISITION
OUTPUT TIMING PULSE GENERATOR
OUTPUT PULSES
SYSTEM CLOCK
TO OTHER MODULES
INPUT CH 1 TIMING PULSE GENERATOR
CH1 INPUT PULSES
INPUT CH 2 TIMING PULSE GENERATOR
CH2 INPUT PULSES
MV-L
MV-C
DIGITAL CLEAN FEED OUTPUT
ANALOG CLEAN FEED OUTPUT
DAC
SYNC/ BURST ADDER (SBA)
Y/C
ENCODER
ANALOG VIDEO
TO CIRCUITRY ON THIS MODULE
EXTERNAL BACKGROUND VIDEO INPUT
CONTROL BUS INTERFACE
PROGRAM OUT
CROSS-HAIR INSERTER
FTB MIX
KEYER (ANALOG)
SYSTEM CONTROL BUS
ANALOG KEY OUTPUT
ANALOG KEY
DAC
KEY
DIGITAL KEY OUTPUT
-5.2V
INTERFACE MODULE
+10V
-10V
POWER REGULATOR
+12V
-12V

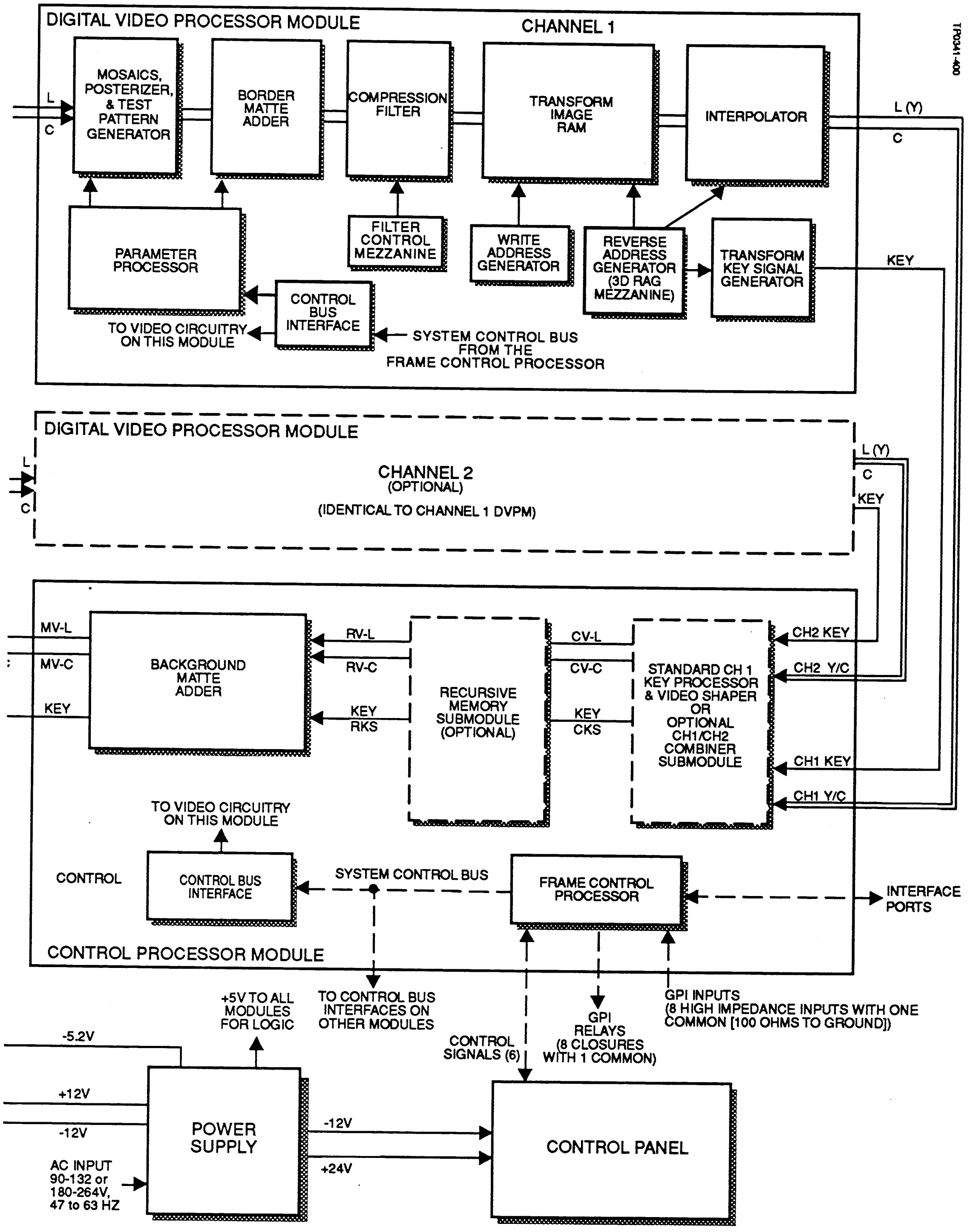

TP0341-400
DIGITAL VIDEO PROCESSOR MODULE
CHANNEL 1
L
C
MOSAICS, POSTERIZER, & TEST PATTERN GENERATOR
BORDER MATTE ADDER
COMPRESSION FILTER
TRANSFORM IMAGE RAM
INTERPOLATOR
L (Y)
C
PARAMETER PROCESSOR
FILTER CONTROL MEZZANINE
WRITE ADDRESS GENERATOR
REVERSE ADDRESS GENERATOR (3D RAG MEZZANINE)
TRANSFORM KEY SIGNAL GENERATOR
KEY
CONTROL BUS INTERFACE
TO VIDEO CIRCUITRY ON THIS MODULE
SYSTEM CONTROL BUS FROM THE FRAME CONTROL PROCESSOR
DIGITAL VIDEO PROCESSOR MODULE
L
C
CHANNEL 2
(OPTIONAL)
(IDENTICAL TO CHANNEL 1 DVPM)
L (Y)
C
KEY
MV-L
MV-C
KEY
BACKGROUND MATTE ADDER
RV-L
RV-C
KEY
RKS
RECURSIVE MEMORY SUBMODULE (OPTIONAL)
CV-L
CV-C
KEY
CKS
STANDARD CH 1 KEY PROCESSOR & VIDEO SHAPER OR OPTIONAL CH1/CH2 COMBINER SUBMODULE
CH2 KEY
CH2 Y/C
CH1 KEY
CH1 Y/C
TO VIDEO CIRCUITRY ON THIS MODULE
CONTROL
CONTROL BUS INTERFACE
SYSTEM CONTROL BUS
FRAME CONTROL PROCESSOR
INTERFACE PORTS
CONTROL PROCESSOR MODULE
+5V TO ALL MODULES FOR LOGIC
TO CONTROL BUS INTERFACES ON OTHER MODULES
CONTROL SIGNALS (6)
GPI RELAYS (8 CLOSURES WITH 1 COMMON)
GPI INPUTS (8 HIGH IMPEDANCE INPUTS WITH ONE COMMON [100 OHMS TO GROUND])
-5.2V
+12V
-12V
AC INPUT 90-132 or 180-264V, 47 to 63 HZ
POWER SUPPLY
-12V
+24V
CONTROL PANEL

Figure 5-10. DPM-700 System Block Diagram

D. Check Control Processor Module: The Control Processor Module includes the standard simple combiner circuits, the optional Combiner Submodule, the optional Recursive Memory Submodule, and the Background Matte Adder circuit block.

(1) Remove the optional Combiner Submodule, if you have it. Does the problem go away? If so, the Combiner is at fault.

(2) Remove the optional Recursive Memory Submodule if you have it. Does the problem go away? If so, the Recursive Memory Submodule is at fault.

(3) Place a matte background on-air. Is the problem present in both the matte and the transformed video? If so, the problem is probably downstream on the output circuits of the Interface Module.

If the problem is in the matte only and not in the transformed video, the Background Matte Adder circuit on the 700 Control Processor Module is probably faulty.

If the problem is only in the transformed video and not in the matte, the problem occurs ahead of the Background Matte Adder (refer to step C above).

E. Check Interface Module: The Interface Module performs output encoding and digital-to-analog conversion (analog signals only) for each of the DPM-700 video outputs. If the video path up to the Interface Module checks out ok, then the problem probably lies on the Interface Module. This is especially true if the digital outputs are clean but the analog outputs exhibit the problem, indicating that the digital-to-analog conversion circuits on the Interface Module are faulty.

8. Key Path Checks

Key problems show up as a noisy key signal or a key signal which does not coincide with the fill video.

A. You can verify or eliminate the Interface Module as the source of a key problem by comparing the ANALOG KEY and DIGITAL KEY outputs. If the analog key is bad while the digital key is good, the problem lies in the Digital To Analog Converter on the Interface Module. If both keys are bad, the problem lies somewhere else in the system, either on the Digital Video Processor Module (the most likely cause) or on the Control Processor or its option submodules.

B. If you have the optional Combiner Submodule and/or the optional Recursive Memory Submodule, you can check whether these are the source of a key problem by removing them one at a time.

If the above tests did not reveal the location of the key problem, there is no way to do any further tests on the key path without digital equipment. However, a good guess as to the cause of the problem is the Digital Video Processor Module where the key signal originates.

REPAIR AND REPLACEMENT INSTRUCTIONS

The DPM-700 is sold and supported by video system distributors. If the unit develops a problem, contact your distributor for service. Do not attempt to repair the unit by replacing components, because repairs that you do yourself may void your warranty. A copy of the warranty that applies to the DPM-700 is included at the front of this manual.

When the DPM-700 is past its warranty period, you can buy service and parts from your distributor or you can buy parts directly from The Grass Valley Group, Inc. You can reach The Grass Valley Group, Inc. PVD Customer Service at telephone number 916-478-3359. Please locate the serial number on your unit and have it ready to give to Customer Service when you call.

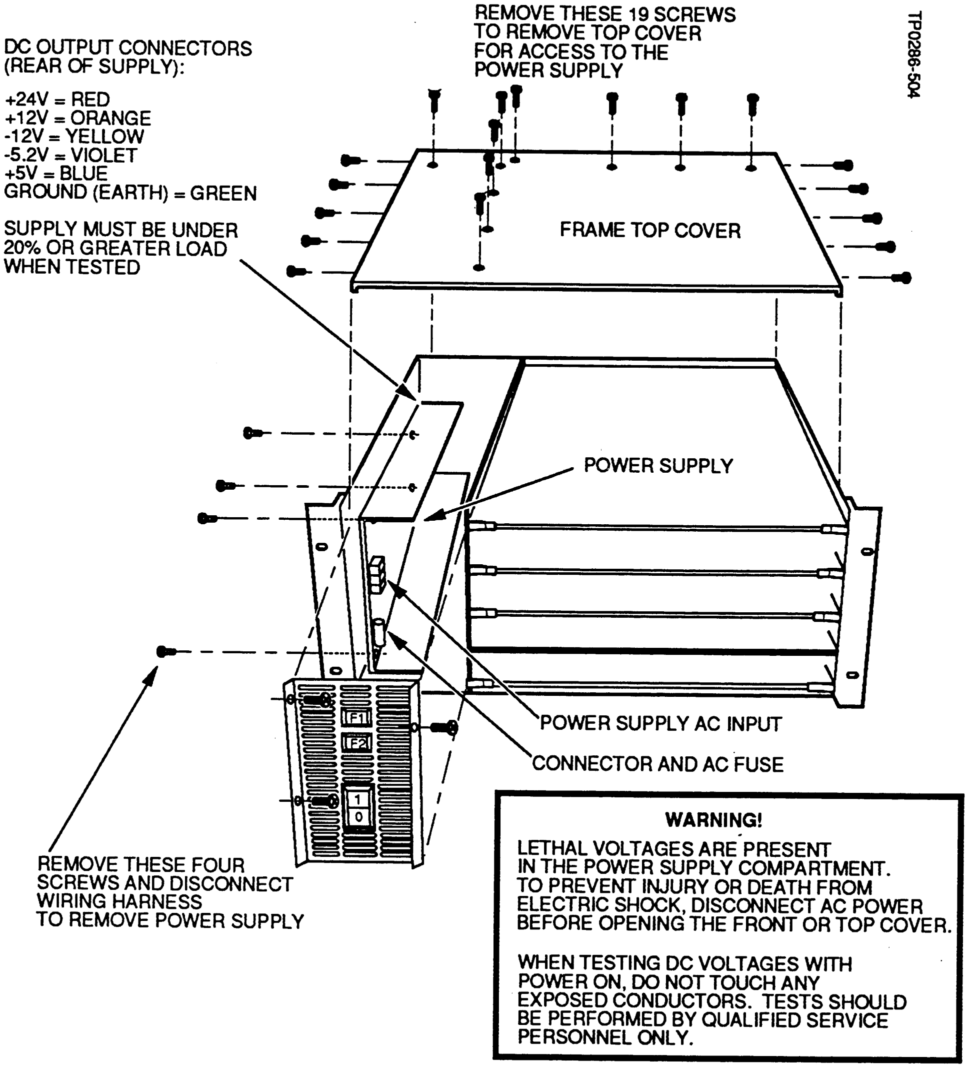
How To Service The Power Supply

The power supply resides inside the left side of the electronics frame. In order to reach the power supply for fuse replacement, voltage checks, wiring checks, or power supply replacement, you must remove the frame's protective switch cover and top cover. Refer to Figure 5-11 and proceed as follows:

WARNING

Lethal (deadly) voltages are present inside the DPM-700 electronics frame. Refer servicing to qualified service technicians. To protect yourself from death or injury by electric shock, disconnect the ac power cord at the back of the frame before opening the frame top cover. When testing for dc voltages with power on, do not touch any exposed wires or connectors.

1. Disconnect the ac line cord at the ac connector on the back of the frame.


DC OUTPUT CONNECTORS
(REAR OF SUPPLY):
+24V = RED
+12V = ORANGE
-12V = YELLOW
-5.2V = VIOLET
+5V = BLUE
GROUND (EARTH) = GREEN
SUPPLY MUST BE UNDER
20% OR GREATER LOAD
WHEN TESTED
REMOVE THESE 19 SCREWS
TO REMOVE TOP COVER
FOR ACCESS TO THE
POWER SUPPLY
TP0286-504
FRAME TOP COVER
POWER SUPPLY
F1
F2
1
0
POWER SUPPLY AC INPUT
CONNECTOR AND AC FUSE
REMOVE THESE FOUR
SCREWS AND DISCONNECT
WIRING HARNESS
TO REMOVE POWER SUPPLY

WARNING!

LETHAL VOLTAGES ARE PRESENT IN THE POWER SUPPLY COMPARTMENT. TO PREVENT INJURY OR DEATH FROM ELECTRIC SHOCK, DISCONNECT AC POWER BEFORE OPENING THE FRONT OR TOP COVER.

WHEN TESTING DC VOLTAGES WITH POWER ON, DO NOT TOUCH ANY EXPOSED CONDUCTORS. TESTS SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL ONLY.

Figure 5-11. Power Supply Servicing

2. Remove the protective cover holding the ON/OFF switch and the dc fuses. This cover is held in place by two screws through its left flange and one screw on its right flange. As you pull the cover toward you to remove it, disconnect the wiring harness from the spade lugs on the power switch and fuse holders. If you are just checking the ac fuse, you may now be able to reach the fuse at the front of the power supply.

3. Remove the frame top cover if you want to test the dc voltages at the back of the power supply or to remove the power supply from the frame. The top cover is held in place by 19 screws along the top and sides of the cover. When the top cover is off, the dc test points at the back of the supply are accessible.

   When testing dc voltages, leave at least two of the frame modules and the panel plugged into the frame to provide a load for the power supply. The supply must be under a partial load in order to provide the correct output voltages.

4. To remove the power supply and its wiring harness, disconnect the wiring harness at the following connection points: the ac connector, the motherboard connector, the ground stud, the fan connector, and the ON/OFF switch and fuse connectors. Mark the wires so you can reconnect them properly. Then remove the four screws on the left side of the electronics frame that hold the power supply in place.

To reinstall the power supply and harness into the frame, perform the steps above in reverse order. If you are unsure about any of the wiring connections, refer to the Electronics Frame Disassembly illustration later in this section for wiring details or consult the wiring diagram in the Drawings section.

Control Panel Disassembly

Removing the Plastic Outer Case

Figure 5-12 and the instructions below explain how to remove the panel's plastic outer case in order to gain access to the dc test points and LED indicators. For routine maintenance and troubleshooting no further disassembly is necessary.

1. Turn system power off, and disconnect the frame-to-panel cable and TTY cable from the back of the panel.

2. Turn the panel upside down and remove the 8 screws along the front and back edges of the panel. Also loosen the four screws on the bottom of the panel that hold the disk drive in place.

3. Hold the plastic case and the panel assembly together and gently turn the panel assembly over (right-side up).

4. Push the disk drive inward so that it will not interfere with removing the case, and then lift the case off of the panel assembly.

   When reassembling, put the case on first, and then don't forget to push the disk drive out again and tighten the disk drive screws.

Complete Disassembly

To disassemble the control panel, refer to Control Panel Assembly Drawing D06-084770 in the Drawings section of this manual. Then proceed with steps 1 through 4 above and the additional steps below:

5. Turn the panel assembly upside down again and remove the 8 screws in coined (convex) areas on the panel bottom plate. This will allow the panel assembly to be separated into two pieces.

6. Disconnect the ribbon cable on the left side and the power cable at the back of the panel which connect the Control Processor to the Switch Board.

7. Separate the upper panel assembly (Switch Board) from the lower assembly (Control Processor).

8. If you want to remove the disk drive, you can do so now. Remove the four screws on the panel bottom plate that hold the disk drive in place and disconnect the cables that connect the disk drive to the Control Processor.

9. If you plan to remove the Control Processor, you can do so now. Remove the 4 hex jackscrews from the 2 D connectors on the back of the bottom assembly and remove the 7 screws on the bottom plate that hold the Control Processor in place.

10. If you want to remove the joystick, you can do so now. On the top of the panel, remove the 4 screws holding the joystick cover ring in place, and disconnect the joystick cables from the Switch Board.

11. Next you can remove the Switch Board. You must remove the Switch Board if you plan to remove the lever arm, the OEM display, or the E-MEM® Board. Follow the steps below:

    A. Remove the lever arm handles, which are held by 2 Allen screws in the ends of the handles. You will need a 1/8" Allen wrench.

    B. Remove the 3 panel knobs (just grasp them firmly and pull them straight up).

    C. Remove the 2 hex standoffs (item 22) and 8 screws on the bottom of the Switch Board holding the Switch Board to the top surface.

    D. Disconnect the cables connecting the Switch Board to the other assemblies.

12. With the Switch Board removed, the lever arm, E-MEM® Board, and the display can be removed by removing the screws holding them in place.

To reassemble, perform the above steps in reverse.

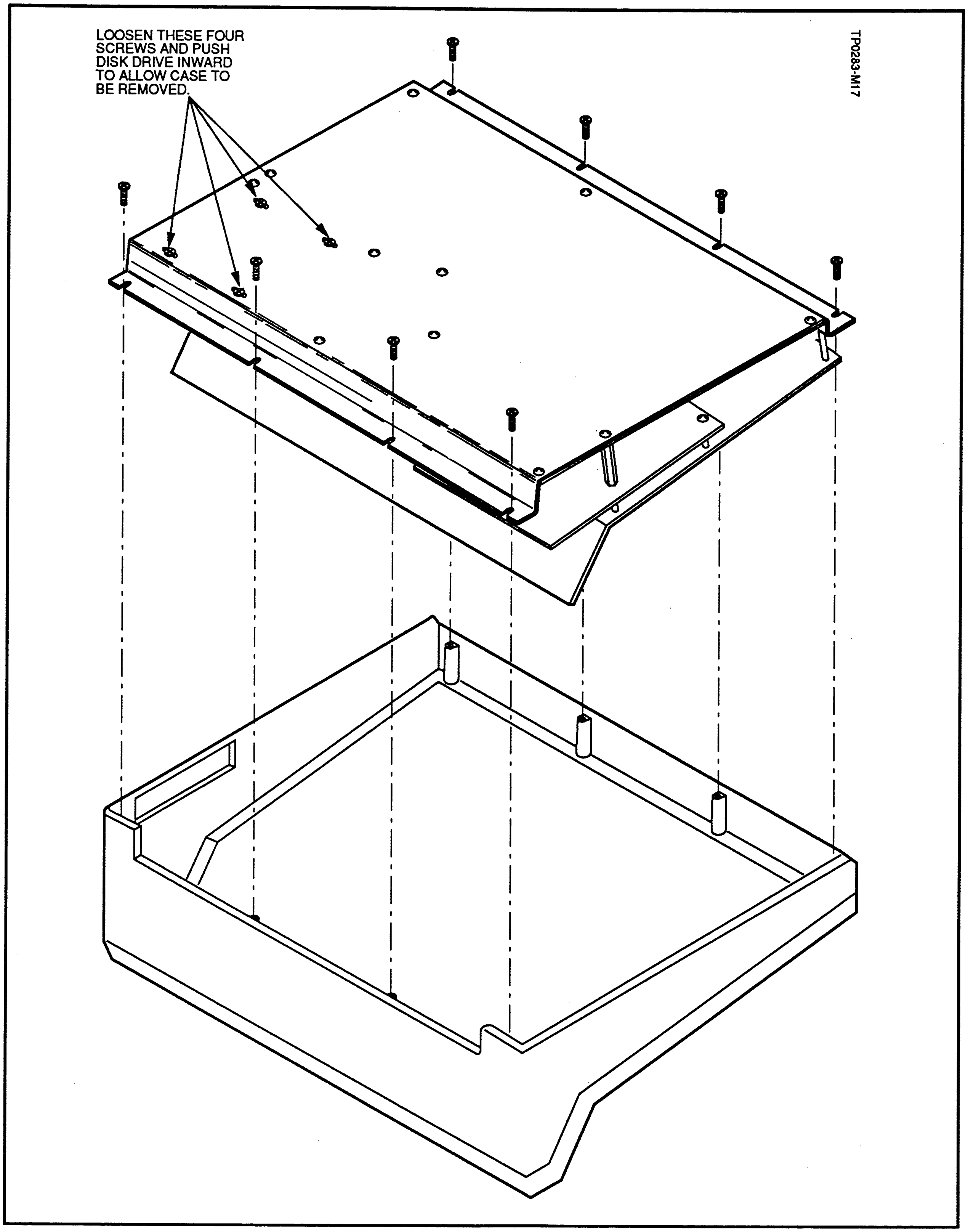

LOOSEN THESE FOUR SCREWS AND PUSH DISK DRIVE INWARD TO ALLOW CASE TO BE REMOVED.
TP0283-M17

Figure 5-12. Removing the Plastic Case from the Panel Assembly

Electronics Frame Disassembly

To remove the motherboards, power supply, or fan assembly from the frame, refer to Figure 5-13 and follow the steps below. To remove only the ON/OFF switch cover, perform only steps 1 and 7. If you need more information, a detailed drawing of the frame and its parts is included in the Drawings section.

1. Disconnect ac power by unplugging the power cord at the ac input connector.
2. Remove all of the modules from the frame by pulling on their ejector tabs and sliding the modules out.
3. Remove the 14 screws holding the top cover in place and lift off the top cover.
4. To remove the power supply, remove the 4 screws on the side of the frame that hold the power supply in place. Disconnect the power supply wiring harness at the following connection points: the ac connector, the motherboard connector, the ground stud, the fan connector, and the ON/OFF switch and fuse connectors.
5. To remove the fan assembly, remove the 4 screws inside the frame in the left side of the module compartment. As you lift the fans out, disconnect the connector plug that connects the fans to the wiring harness if you have not already done so.
6. To remove the motherboard assembly, remove the 5 screws along the bottom of the outer motherboard below the BNC connectors. Then disconnect the motherboards from the wiring harness if you have not already done so, and lift them out of the frame.
7. To remove the power supply cover plate from the front of the frame, remove the 3 screws that hold it in place. As you pull the plate toward you to remove it, disconnect the wiring harness from the spade lugs on the power switch and fuse holders if you have not already done so.

To reassemble the frame, reverse the steps above.

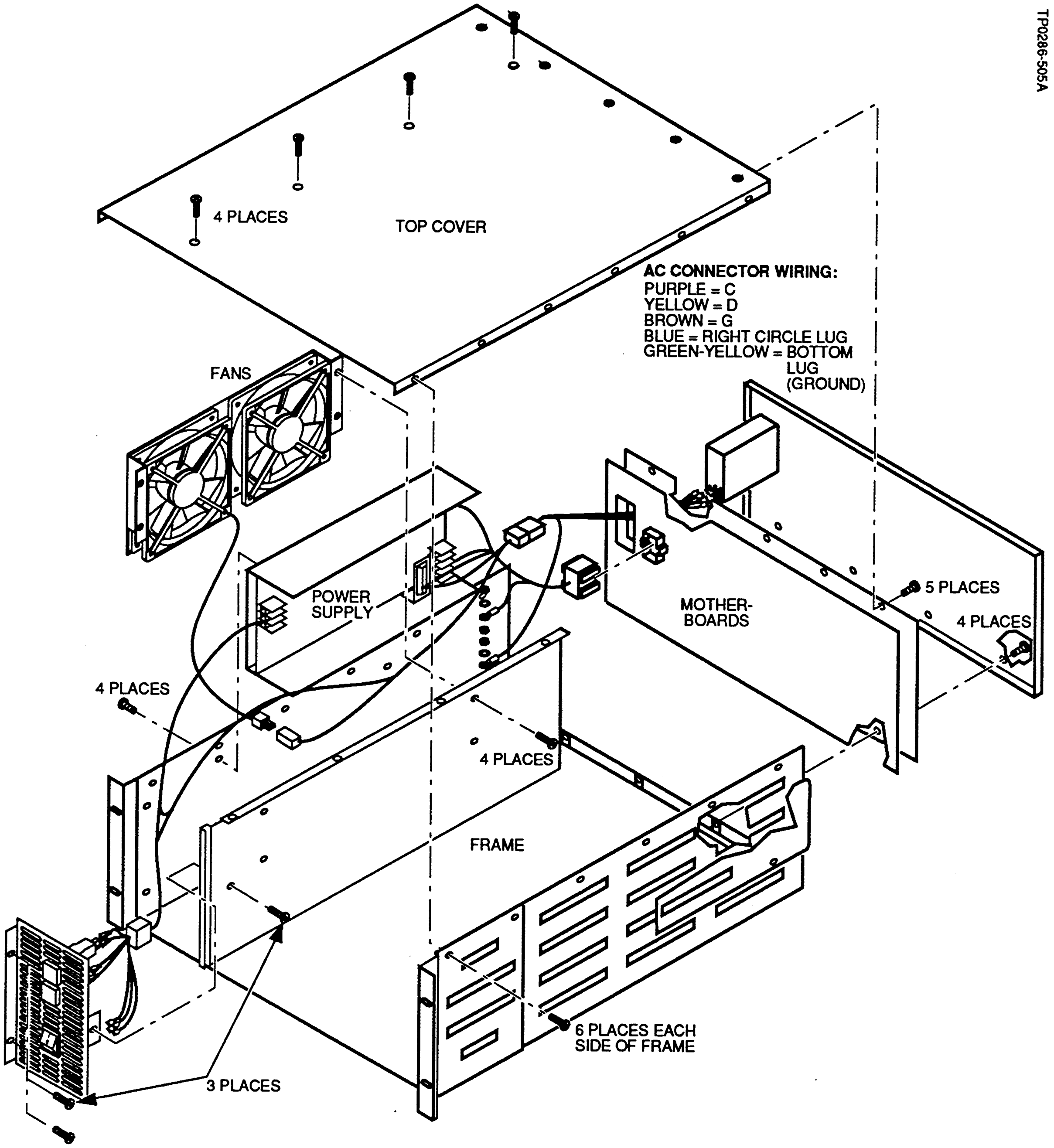

TP0286-505A
4 PLACES
TOP COVER
AC CONNECTOR WIRING:
PURPLE = C
YELLOW = D
BROWN = G
BLUE = RIGHT CIRCLE LUG
GREEN-YELLOW = BOTTOM LUG (GROUND)
FANS
POWER SUPPLY
MOTHER-BOARDS
5 PLACES
4 PLACES
4 PLACES
4 PLACES
FRAME
6 PLACES EACH SIDE OF FRAME
3 PLACES

Figure 5-13. Disassembling the Electronics Frame

ADJUSTMENTS

Every DPM-700 is fully aligned at the factory and does not need any readjustment even if modules are replaced. Additionally, some of the adjustable components in the DPM-700 can only be aligned at the Grass Valley Group factory using special test equipment. Therefore, we recommend that you not adjust your system.

However, if you are an experienced service engineer and you have replaced damaged parts in an adjustable circuit, you may wish to adjust the DPM-700 for optimum performance. In this case, there are some adjustments that you can make in the field; these are given in the following procedure and summarized in Table 5-4 (NTSC) and Table 5-5 (PAL), which are located at the end of their respective sub-sections. This adjustment procedure should be performed only by qualified service personnel because it requires knowledge of video test equipment and video test methods as well as proper safety precautions when working near lethal voltages.

Equipment Needed

The following equipment is required in order to make adjustments:

- Externally triggered 100 MHz oscilloscope or waveform monitor with a probe that has 11pF capacitance or less.
- 4 1/2 digit digital voltmeter with clip leads
- Video signal generator capable of generating color bars, and pulse and bar video test signals.

Reference Information

If you need help identifying components or determining the function of particular adjustments in a circuit, refer to the component location, block, and schematic drawings located in the Drawings section of this manual. A system block diagram is also included earlier in this section.

Using The Optional Extender Boards

Adjusting the DPM-700 is made considerably easier if you have the optional extender boards, which extend the frame modules outside of the frame for easier access to test points and adjustments. Without these boards, you will have to insert and remove frame modules repeatedly to make the adjustments. Also, some test points can only be accessed with special cabling without the an extender board.

There are two extender boards: the Analog Extender is used for the Interface Module, and the Digital Extender is used for the Control Processor and the Video Processor Modules.

CAUTION

To avoid electrical damage to the modules, be sure you use the correct extender (analog or digital) for the module you plan to test.

As shown in Figure 5-14, the extender boards unfold until they are straight and the two knobs in the center section of the boards lock into place. You can then remove the module that you plan to adjust from the frame and insert the correct extender board in the module's place and lock down the extender's ejector tabs. Then insert the module into the extender and lock the module's ejector tabs in place.

CAUTION

To avoid damage to connectors from electrical arcing, always turn off system power before inserting or removing modules.

Note: *The extenders may affect the accuracy of some adjustments. Always verify that adjustments are still correct when the module is removed from the extender and re-inserted into the frame.*

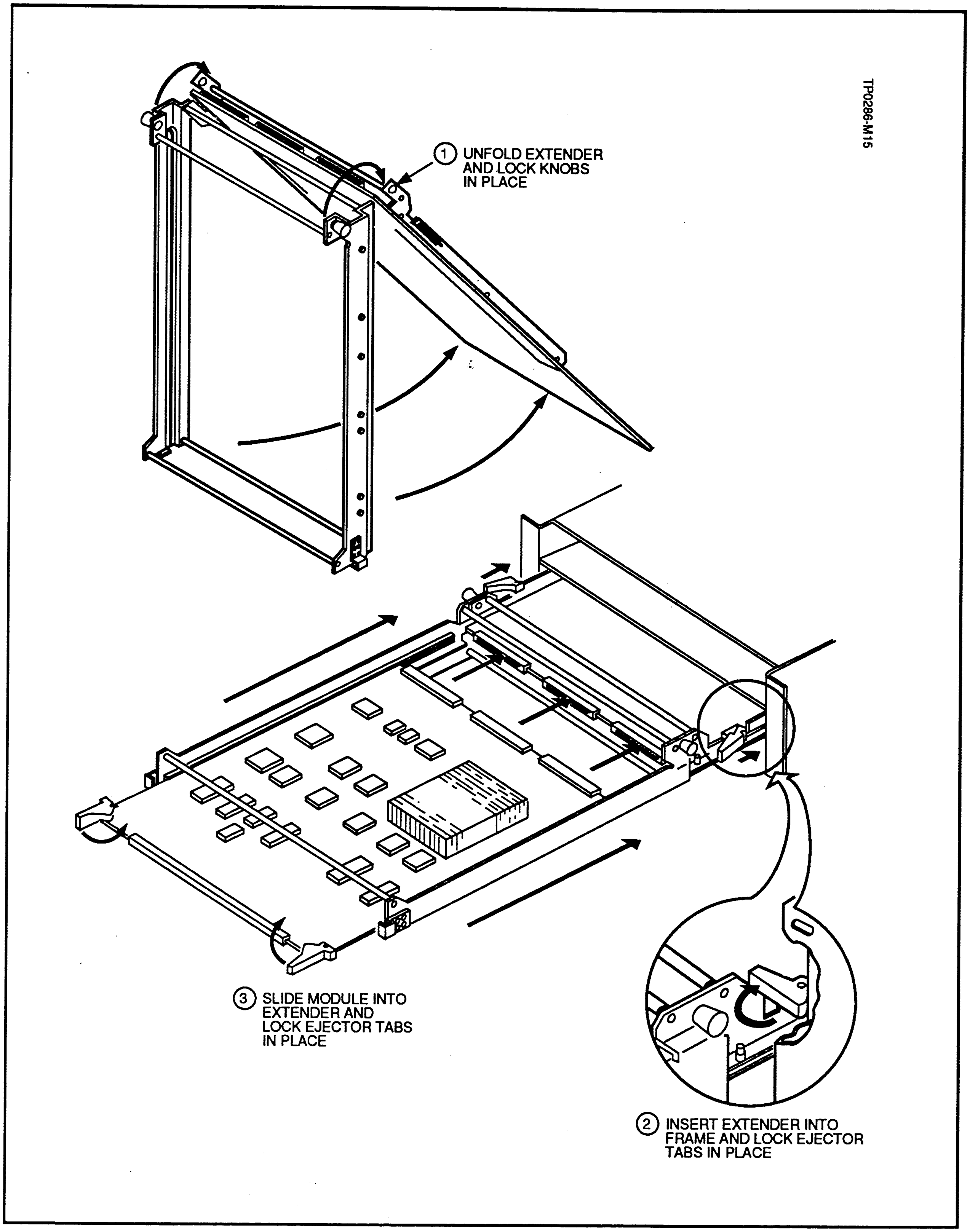

TP0286-M15
① UNFOLD EXTENDER AND LOCK KNOBS IN PLACE
② INSERT EXTENDER INTO FRAME AND LOCK EJECTOR TABS IN PLACE
③ SLIDE MODULE INTO EXTENDER AND LOCK EJECTOR TABS IN PLACE

Figure 5-14. How to Use the Extender Boards

Before You Make Any Adjustments

- Turn system power off and on again to ensure that the system is in its default operating state.
- Before making any adjustments, ensure accurate results by properly calibrating your test equipment and signal generators according to the manufacturer's instructions.
- When using the oscilloscope, always attach the ground clip to the nearest GND test point.
- To prevent damage to sensitive circuits, be sure to observe static discharge protection techniques when handling circuit boards (ground your body and your test equipment).

Power Supply Adjustments

DC Output Voltage Adjustments

We strongly recommend that you do not adjust the power supply unless you are certain that it is set incorrectly and is causing a system problem. If you adjust the power supply, you may affect the operation of other parts in the system which will require you to check all system adjustments.

1. The power supply must be partially removed in order to reach the adjustment potentiometers. Refer to the instructions earlier in this section that explain How To Service The Power Supply and follow the instructions there to unbolt the supply from the frame so that it can be turned toward you for adjustment. Leave the wiring harness connected and leave all modules in the electronics frame to provide a load for the supply.

WARNING

Lethal voltages are present inside the DPM-700 electronics frame. To protect yourself from injury or death from electric shock, disconnect the ac power cord at the back of the frame before opening the frame top cover. When testing the power supply dc voltages with power on, do not touch any exposed wires or connectors.

2. Monitor each dc output at the back of the supply with a voltmeter to check for the correct dc output voltage listed in the following table. Locate the potentiometers on the power supply drawing D16769-1. DO NOT ADJUST THE CURRENT LIMIT (I) OR FREQUENCY POTENTIOMETERS.

Table 5-3. Power Supply Voltage Tolerances

Output	Voltage	Tolerance
V1 (S1+)	+5V	±.05V
V2	+12V	+.25, -.05
V3	-5.2V	±.05V
V4	+24V	±.5V
V5	-12V	+.25, -.05

Interface Module Voltage Regulator Output

The following adjustments set the Interface Module voltage regulator dc outputs. Do not adjust the regulator unless you have replaced parts and/or you are certain that the system has problems caused by incorrect voltage regulation. If you do adjust the regulator, you will need to verify that all of the adjustments in this section are still correct.

1. Monitor TP300 (NTSC) or TP401 (PAL) +10V on the front of the Interface module with a digital voltmeter.

2. Adjust R678 (NTSC) or R301 (PAL) for +10.00V ±0.075V. Check the other dc test points near the +10V test point and verify that they are now correct also: -10.00V ±0.075V, -5.2V ±0.1V, and +5V ±0.075V.

NTSC Output Adjustments

Video and Key Drives

These adjustments set the output impedance of the video and key output DACs to match the input requirements of the low-pass filters. Adjustment is necessary only if parts are replaced.

1. Turn off power to the system.
2. Locate jumpers J12 and J13 in the Video Filter and Key Filter sections of the Interface Module and remove their shorting jacks.
3. Use an ohmmeter to measure between pin 2 of jumper J12 and GND at test point TP532.
4. Adjust potentiometer R196 VDR for 301 ohms ±0.3 ohms.
5. Move the ohmmeter to measure between pin 2 of jumper J13 and GND at test point TP532.
6. Adjust potentiometer R227 KDR for 301 ohms ±0.3 ohms.
7. Replace the shorting jacks on the jumpers and turn power back on.

Digital-to-Analog Converter Reference

The following steps set the reference voltage for the PGM and KEY output DACs. This adjustment should be necessary only if parts are replaced.

1. Monitor test point TP163 with a digital voltmeter.
2. Adjust potentiometer R187 PGM REF for -1.000V ±0.003V.
3. Monitor test point TP203 with the voltmeter.
4. Adjust potentiometer R224 KEY REF for -1.000V ±0.003V.

NTSC Output Adjustments Continued

Program and Key Output DC Clamp Level

The following adjustment ensures that the Program video output blanking level is clamped at 0V.

1. In the KEYER section of the panel, select MATTE as the KEY BKGD, XFORM as the KEY SOURCE, and VIDEO as the KEY FILL.
2. On the back of the electronics frame, monitor Program Out at J17 with the oscilloscope or waveform monitor. Set the instrument to show one line of video.
3. Adjust potentiometer R178 VDC to set program video blanking so that the blanking interval after burst is all the same level, ±5mV.
4. Monitor test point TP200 in the Key Filter section.
5. Adjust potentiometer R215 KDC to set key signal blanking at -30V ±5 mV. This adjustment not only sets the blanking level, but also ensures that the key mix multiplier turns completely off when the key signal is at minimum level.
6. Monitor the KEY MIX control signal at TP206 on the Interface Module.
7. Select EXT at the KEY BKGD section of the panel and select the DOWNSTREAM timing mode at the STREAMLINE™ display.
8. Adjust R241 to set the KEY MIX control signal to approximately +1.03V at the positive peak. This setting is approximate; to check whether it is correct, mix the key off and on at the panel and watch the video monitor to be sure the key is turning fully off and on. The minimum level of the key mix control signal is set by R215, which was adjusted in step 5.

Output Video and Key Gain

The adjustments that follow set the peak-to-peak amplitude of the PROGRAM video output, the CLEAN FEED video output, and the KEY output.

NTSC Output Adjustments Continued

1. Using the STREAMLINE™ section of the panel, select the color bars (BARS) diagnostic test pattern. In the KEYER section of the panel, select MATTE as the KEY BKGD, XFORM as the KEY SOURCE, and VIDEO as the KEY FILL.
2. Monitor PROGRAM OUTPUT connector J17 at the back of the frame using an oscilloscope or waveform monitor. Set the instrument to show a single line of video.
3. Adjust potentiometer R251 on the Interface module for exactly 1.00Vpp video. This sets the PROGRAM OUTPUT gain.
4. Monitor CLEAN FEED OUTPUT J16 at the back of the frame using the oscilloscope or waveform monitor.
5. Adjust potentiometer R254 on the Interface Module for exactly 1.00Vpp video. This sets the CLEAN FEED OUTPUT gain.
6. Monitor KEY OUTPUT connector J15 at the back of the frame.
7. Make the key signal fill the entire screen on the PROGRAM video monitor by pressing CLEAR WORKING KEYFRAME at the panel.
8. Adjust R238 on the Interface Module for a 1.00Vpp key signal.

Output Blanking Width

The following adjustments set the width of NORMAL BLANKING and NARROW BLANKING. Each edge of NORMAL and NARROW BLANKING is adjusted independently.

1. Use the STREAMLINE™ panel to select the color bars diagnostic test pattern.
2. Refer to Figure 5-15. Monitor test point TP205 in the Keyer Control circuit on the Interface Module with an oscilloscope. Set the instrument to show one horizontal line of the combined

NTSC Output Adjustments Continued

NORMAL/NARROW blanking signal. Use the other channel of the oscilloscope to monitor one horizontal line of color bars at test point TP538. Place the two channel displays near each other so that you can compare the timing of the signals.

3. Set the oscilloscope time base so that you can see the leading edges of the signals in as much detail as possible.

4. To ensure that all waveform transitions are present, center the following potentiometers: R137; R139; R136; and R138.

5. Adjust potentiometer R137 on the Interface module to set the 50% point of the leading edge of NORMAL BLANKING to occur 1.5 µS before the 50% point of the leading edge of the sync pulse.

6. Adjust potentiometer R139 to set the 50% point of the leading edge (first postive-going edge) of NARROW BLANKING to occur 450nS before the 50% point of the leading edge of the sync pulse.

7. Set the oscilloscope to display the trailing edge of NORMAL BLANKING and the trailing edge of the burst envelope in as much detail as possible.

8. Adjust potentiometer R136 on the Interface module to set the 50% point of the trailing edge (second positive-going edge) of NORMAL blanking to occur 1.4 µS after the end of the burst envelope (see Figure 5-15).

9. Adjust potentiometer R138 to set the 50% point of the trailing edge of NARROW BLANKING to occur 450nS after the end of the burst envelope.

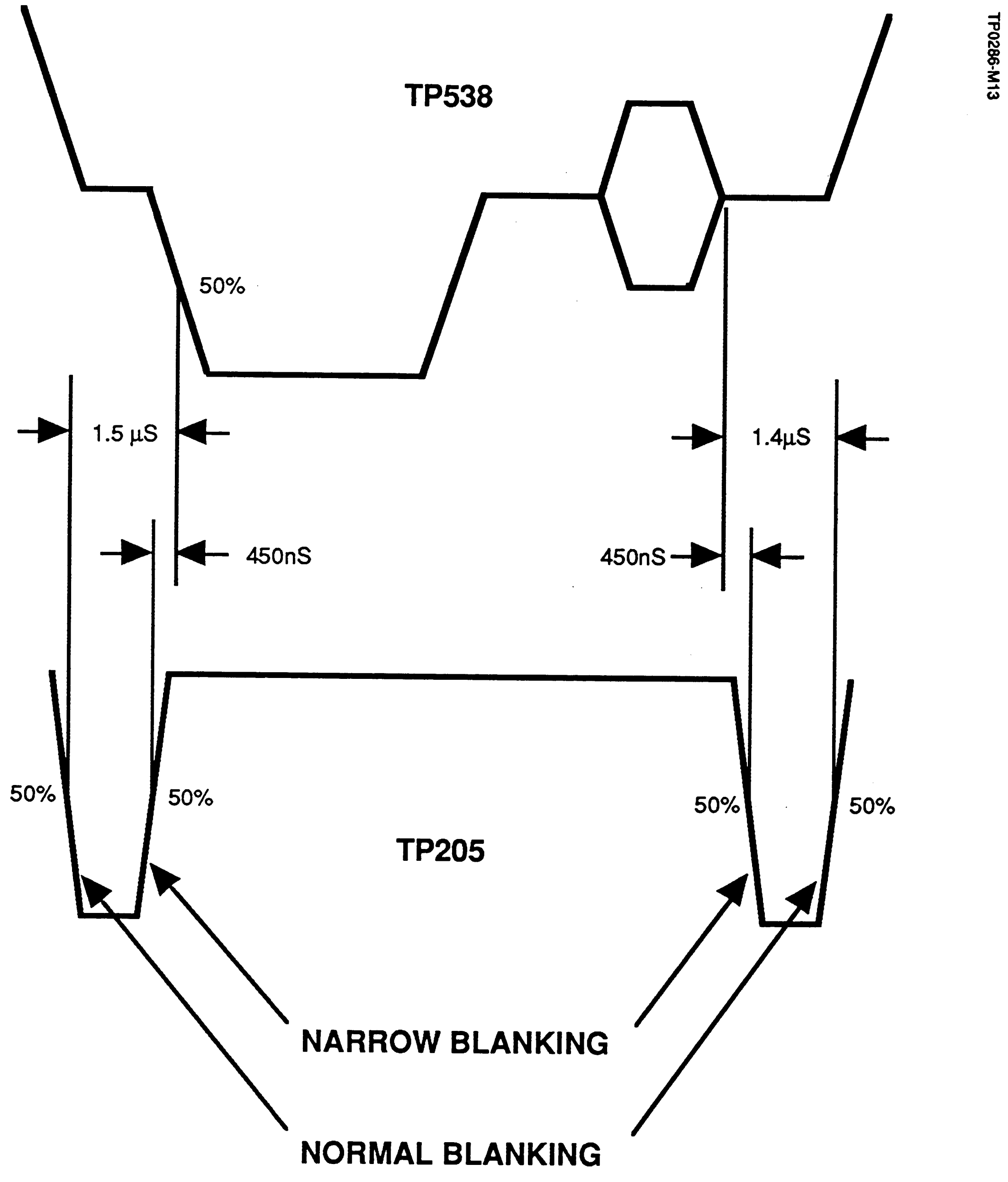

TP0286-M13
TP538
50%
1.5 µS
1.4µS
450nS
450nS
50%
50%
50%
50%
TP205
NARROW BLANKING
NORMAL BLANKING

Figure 5-15. NTSC Output Blanking Adjustments

NTSC Input Adjustments

The following input alignment procedures should be performed after the output procedures on the previous pages.

Input Blanking DC Level

The following steps set the blanking level for both channels just before the inputs enter the A-to-D Converter on the Input Submodule. Before making these adjustments, ensure that the system timing is set correctly as described in the Installation section of this manual. If the timing is incorrect, the clamp circuits may clamp the video signal at the wrong point, causing the signal to have the wrong dc level.

1. Apply a 1.00Vpp NTSC video signal to the video inputs.
2. Monitor test point TP50 ADC on the Input Submodule with an oscilloscope or waveform monitor. Set the instrument to view a single line of video.
3. Adjust potentiometer R61 CLAMP to set the blanking level of the video signal to -0.471V.

A-to-D Converter Reference Voltage

The following steps set the reference voltage for the input Analog-to-Digital Converter. This adjustment should be necessary only if you replace parts in this circuit.

1. Monitor test point TP77 ADC REF VOLT on the Input Submodule with a digital voltmeter.
2. Adjust potentiometer R64 ADC REF for -2.000V ±.003V.

Input A and B Gain

These steps set the peak-to-peak amplitude of each video input channel.

1. Apply a 1.00Vpp NTSC video signal to both video inputs.

NTSC Input Adjustments Continued

2. On the Input Submodule, monitor Program Out at J17 with an oscilloscope or waveform monitor. Set the instrument to view a single line of video.
3. Select INPUT A at the panel and adjust potentiometer R2 for 1.00Vpp video.
4. Select INPUT B and adjust potentiometer R14 for 1.00Vpp video.

External Background Input Gain

The following steps set the gain of the external BACKGROUND input.

1. Apply a precise 1.00Vpp video signal to BACKGROUND input connector J19 at the back of the frame.
2. Select EXT as the KEY BKGD and XFORM as the KEY SOURCE in the KEYER portion of the panel. Use the TRANSFORM controls to move the primary video image(s) (channel 1 and channel 2 in two channel systems) completely off screen so that the external background video completely fills the raster.
3. Monitor Program Out at connector J17 at the back of the frame using the oscilloscope or waveform monitor. Set the instrument to show a single line of video.
4. Adjust potentiometer R114 BKG GAIN for 1.00Vpp video.

Table 5-4. List of DPM-700 NTSC Adjustments

Adjustment	Test Point	Module	Function
V1 - V5	PS DC lugs	Power Supply	Power supply dc out adjust
R678	+10V, -10V	Interface Module	On-board regulator adjust
R61CLAMP	TP50 ADC	Input Submodule	Video input blanking dc
R97 A	TP50 ADC	Input Submodule	CH A input gain
R100 B	TP50 ADC	Input Submodule	CH B input gain
R250	TP537	Interface Module	EXT BKGD input gain
R64 ADC REF	TP77 ADC REF	Input Submodule	Input A to D gain
R196 VDR	J12 pin 2 & GND	Interface Module	Video out DAC impedance
R227 KDR	J13 pin 2 & GND	Interface Module	Key out DAC impedance
R187	TP163	Interface Module	PGM DAC reference voltage
R224	TP203	Interface Module	KEY DAC reference voltage
R178 VDC	TP160	Interface Module	PGM out blanking dc
R215 KDC	TP200	Interface Module	Key out blanking dc
R251	PROGRAM OUT	Interface Module	PGM out gain
R254	CLEAN FD OUT	Interface Module	CLEAN FEED out gain
R238	KEY OUT	Interface Module	KEY output gain
R241	TP206	Interface Module	Key mixer overdrive
R137	TP205	Interface Module	PGM blanking leading edge
R139	TP205	Interface Module	Key blanking leading edge
R136	TP205	Interface Module	PGM blanking trailing edge
R138	TP205	Interface Module	Key blanking trailing edge

PAL Output Adjustments

Video and Key Drives

These adjustments set the output impedance of the video and key output DACs to match the input requirements of the low-pass filters. Adjustment is necessary only if parts are replaced.

1. Turn off power to the system.
2. Locate jumpers J101 and J201 in the Video Filter and Key Filter sections of the Interface Module and remove their shorting jacks.
3. Use an ohmmeter to measure between pin 2 of jumper J101 and GND at test point TP109.
4. Adjust potentiometer R147 VDR for 181 ohms ±0.3 ohms.
5. Move the ohmmeter to measure between pin 2 of jumper J201 and GND at test point TP109.
6. Adjust potentiometer R263 KDR for 181 ohms ±0.3 ohms.
7. Replace the shorting jacks on the jumpers and turn power back on.

Digital-to-Analog Converter Reference

The following steps set the reference voltage for the PGM and KEY output DACs. This adjustment should be necessary only if parts are replaced.

1. Monitor test point TP108 on the Interface Module with a digital volt-meter.
2. Adjust potentiometer R145 PGM REF for -1.000V ±0.003V.
3. Monitor test point TP208 with the voltmeter.
4. Adjust potentiometer R261 KEY REF for -1.000V ±0.003V.

PAL Output Adjustments Continued

Program and Key Output DC Clamp Level

The following adjustment ensures that the Program video output blanking level is clamped at 0V.

1. In the KEYER section of the panel, select MATTE as the KEY BKGD, XFORM as the KEY SOURCE, and VIDEO as the KEY FILL.
2. Monitor PROGRAM OUTPUT connector J17 at the back of the frame using an oscilloscope or waveform monitor. Set the instrument to show a single line of video.
3. Adjust potentiometer R129 VDC to set program video blanking so that the blanking interval after burst is all the same level, ±5mV.
4. Monitor test point TP204 in the Key Filter section.
5. Adjust potentiometer R261 KDC to set key signal blanking at -30V ±5 mV. This adjustment not only sets the blanking level, but also ensures that the key mix multiplier turns completely off when the key signal is at minimum level.
6. Monitor the KEY MIX control signal at TP206 on the Interface Module.
7. Select EXT at the KEY BKGD section of the panel and select the DOWNSTREAM timing mode at the STREAMLINE™ display.
8. Adjust R241 to set the KEY MIX control signal to approximately +1.03V at the positive peak. This setting is approximate; to check whether it is correct, mix the key off and on at the panel and watch the video monitor to be sure the key is turning fully off and on. The minimum level of the key mix control signal is set by R215, which was adjusted in step 5.

Output Video and Key Gain

The adjustments below set the peak-to-peak amplitude of the PROGRAM video output, the CLEAN FEED video output, and the KEY output.

PAL Output Adjustments Continued

1. Using the STREAMLINE™ section of the panel, select the color bars (BARS) diagnostic test pattern. In the KEYER section of the panel, select MATTE as the KEY BKGD, XFORM as the KEY SOURCE, and VIDEO as the KEY FILL.
2. Monitor PROGRAM OUTPUT connector J17 at the back of the frame using an oscilloscope or waveform monitor. Set the instrument to show a single line of video.
3. Adjust potentiometer R115 on the Interface module for exactly 1.00Vpp video. This sets the PROGRAM OUTPUT gain.
4. Monitor CLEAN FEED OUTPUT J16 at the back of the frame using the oscilloscope or waveform monitor.
5. Adjust potentiometer R116 on the Interface Module for exactly 1.00Vpp video. This sets the CLEAN FEED OUTPUT gain.
6. Monitor KEY OUTPUT connector J15 at the back of the frame.
7. Make the key signal fill the entire screen on the PROGRAM video monitor by pressing CLEAR WORKING KEYFRAME at the panel.
8. Adjust R206 on the Interface Module for a 1.00Vpp key signal.

Output Blanking Width

The following adjustments set the width of NORMAL BLANKING and NARROW BLANKING. Each edge of NORMAL and NARROW BLANKING is adjusted independently.

1. Use the STREAMLINE™ panel to select the color bars diagnostic test pattern.
2. Refer to Figure 5-16. Monitor test point TP202 in the Keyer Control circuit on the Interface Module with an oscilloscope. Set the instrument to show one horizontal line of the combined

PAL Output Adjustments Continued

NORMAL/NARROW blanking signal. Use the other channel of the oscilloscope to monitor one horizontal line of color bars at test point TP101. Place the two channel displays near each other so that you can compare the timing of the signals.

3. Set the oscilloscope time base so that you can see the leading edges of the signals in as much detail as possible.

4. To ensure that all waveform transitions are present, center the following potentiometers: R229; R230; R232; and R233.

5. Adjust potentiometer R233 on the Interface module to set the 50% point of the leading edge of NORMAL BLANKING to occur 1.5 µS before the 50% point of the leading edge of the sync pulse.

6. Adjust potentiometer R232 to set the 50% point of the leading edge (first postive-going edge) of NARROW BLANKING to occur 450nS before the 50% point of the leading edge of the sync pulse.

7. Set the oscilloscope to display the trailing edge of NORMAL BLANKING and the trailing edge of the burst envelope in as much detail as possible.

8. Adjust potentiometer R229 on the Interface module to set the 50% point of the trailing edge (second positive-going edge) of NORMAL blanking to occur 1.5 µS after the end of the burst envelope (see Figure 5-16).

9. Adjust potentiometer R230 to set the 50% point of the trailing edge of NARROW BLANKING to occur 450nS after the end of the burst envelope.

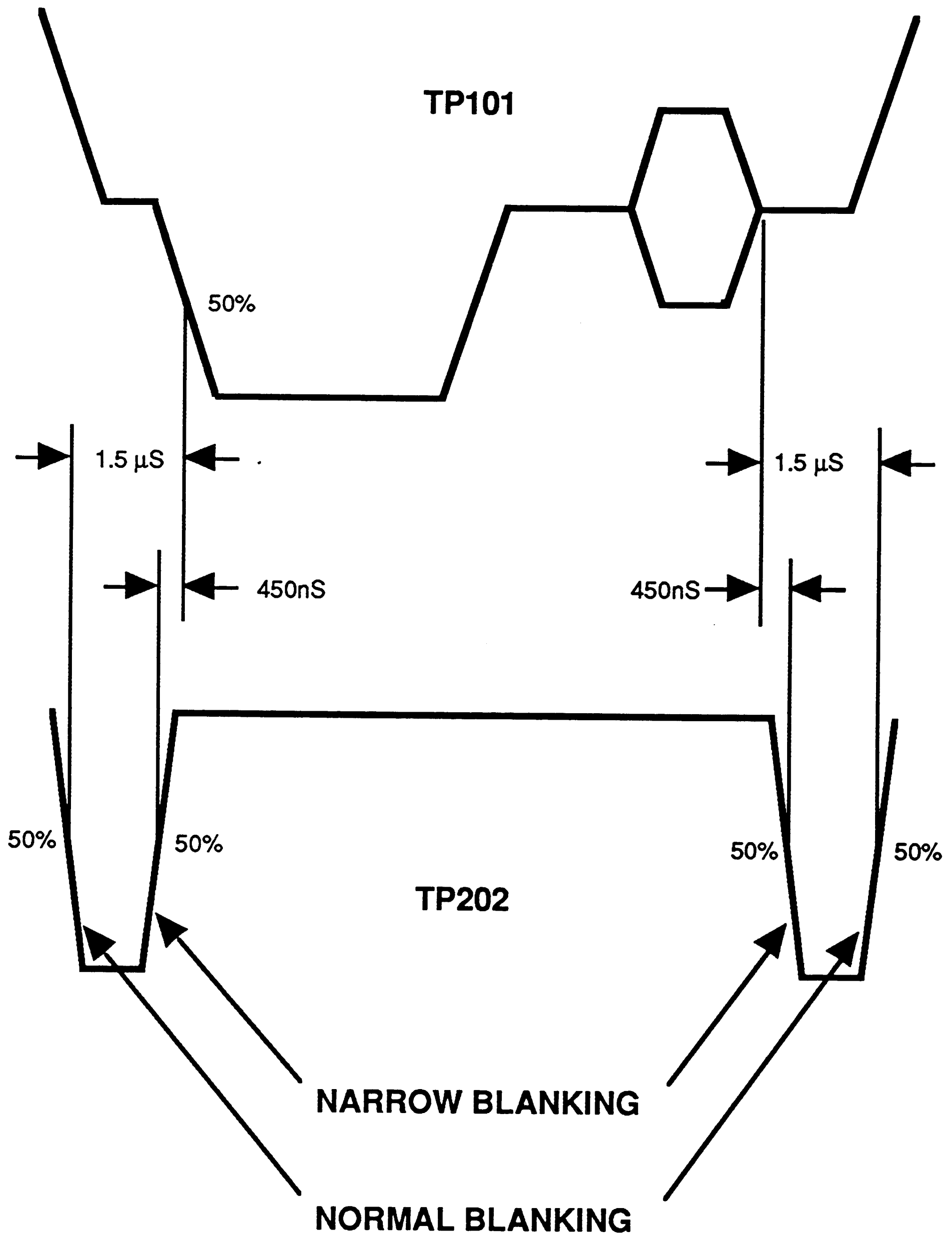

TP101
50%
1.5 µS
1.5 µS
450nS
450nS
50%
50%
50%
50%
TP202
NARROW BLANKING
NORMAL BLANKING

Figure 5-16. PAL Output Blanking Adjustments

PAL Input Adjustments

The following input alignment procedures should be performed after the output procedures on the previous pages.

Input Blanking DC Level

The following steps set the blanking level for both channels just before the inputs enter the A-to-D Converter on the Input Submodule. Before making these adjustments, ensure that the system timing is set correctly as described in the Installation section of this manual. If the timing is incorrect, the clamp circuits may clamp the video signal at the wrong point, causing the signal to have the wrong dc level.

1. Apply a 1.00Vpp PAL video signal to the video inputs.
2. Monitor test point TP41 ADC on the Input Submodule with an oscilloscope or waveform monitor. Set the instrument to view a single line of video.
3. Adjust potentiometer R43 CLAMP to set the blanking level of the video signal to -0.50V.

A-to-D Converter Reference Voltage

The following steps set the reference voltage for the input Analog-to-Digital Converter. This adjustment should be necessary only if you replace parts in this circuit.

1. Monitor test point TP40 ADC REF VOLT on the Input Submodule with a digital voltmeter.
2. Adjust potentiometer R45 ADC REF for -2.000V ±.003V.

Input A and B Gain

These steps set the peak-to-peak amplitude of each video input channel.

1. Apply a 1.00Vpp PAL video signal to both video inputs.

PAL Input Adjustments Continued

2. On the Input Submodule, monitor Program Out at J17 with an oscilloscope or waveform monitor. Set the instrument to view a single line of video.
3. Select INPUT A at the panel and adjust potentiometer R97 for 1.00Vpp video.
4. Select INPUT B and adjust potentiometer R100 for 1.00Vpp video.

External Background Input Gain

The following steps set the gain of the external BACKGROUND input.

1. Apply a precise 1.00Vpp video signal to BACKGROUND input connector J19 at the back of the frame.
2. Select EXT as the KEY BKGD and XFORM as the KEY SOURCE in the KEYER portion of the panel. Use the TRANSFORM controls to move the primary video image(s) (channel 1 and channel 2 in two channel systems) completely off screen so that the external background video completely fills the raster.
3. Monitor Program Out at J17 using the oscilloscope or waveform monitor. Set the instrument to show a single line of video.
4. Adjust potentiometer R250 BKG GAIN for 1.00Vpp video.

Table 5-5. List of DPM-700 PAL Adjustments

Adjustment	Test Point	Module	Function
V1 - V5	PS DC lugs	Power Supply	Power supply dc out adjust
R301	+10V, -10V	Interface Module	On-board regulator adjust
R43CLAMP	TP41 ADC	Input Submodule	Video input blanking dc
R2 A	PROGRAM OUT	Input Submodule	CH A input gain
R14 B	PROGRAM OUT	Input Submodule	CH B input gain
R114	PROGRAM OUT	Interface Module	EXT BKGD input gain
R45 ADC REF	TP40 ADC REF	Input Submodule	Input A to D gain
R147 VDR	J101 pin 2 & GND	Interface Module	Video out DAC impedance
R263 KDR	J201 pin 2 & GND	Interface Module	Key out DAC impedance
R145	TP108	Interface Module	PGM DAC reference voltage
R261	TP208	Interface Module	KEY DAC reference voltage
R129 VDC	PROGRAM OUT	Interface Module	PGM out blanking dc
R261 KDC	TP204	Interface Module	Key out blanking dc
R115	PROGRAM OUT	Interface Module	PGM out gain
R116	CLEAN FD OUT	Interface Module	CLEAN FEED out gain
R206	KEY OUT	Interface Module	KEY output gain
R219	TP201	Interface Module	Key mixer overdrive
R233	TP202	Interface Module	PGM blanking leading edge
R232	TP202	Interface Module	Key blanking leading edge
R229	TP202	Interface Module	PGM blanking trailing edge
R230	TP202	Interface Module	Key blanking trailing edge

THE SYSTEM SOFTWARE and DIAGNOSTIC DISKS

The DPM-700 contains three separate microprocessors which run from the system's operating software. They are:

- The control panel CPU (U15) on the 710 Control Panel Processor Module
- The communications CPU (U78) on the 700 Frame Control Processor Module
- The transform CPU (U58), also on the 700 Module

The System Software Disk (074750) contains a copy of the system operating software and a utility program needed to load the system operating software into the microprocessor EEPROMs. This allows you to:

- Upgrade your DPM-700 to a new version of system operation software.
- Verify the software in the EEPROMs by comparing it to the System Software Disk.
- Check the software version numbers in the EEPROMs.

The Diagnostic Software Disk (074751) can be used to examine various aspects of the three microprocessors. You can use it to:

- Check system functions.
- Perform diagnostics to isolate a problem.
- Verify or change certain user-definable software settings.

Both the System Software Disk and the Diagnostic Software Disk provide menu selections to change the EEPROM device types. The device type of an EEPROM, for our purposes, is defined as the the manufacturer and part number of the EEPROM. The device types of the EEPROMs must be set in the programming for the system to operate properly. These are set at the factory and will probably never need to be changed. If an EEPROM is replaced, however, it may be necessary to change its device type in the system programming.

Table 5-6 shows each microprocessor's STREAMLINE™ Display name, the locator designator (device number) for each device, its function, and its associated EEPROMs.

Using the Disks

The System Software Disk and the Diagnostic Software Disk are standard 3-1/2 inch floppy disks. Each contains its own utility program for performing its functions. You can load the program using the boot-up procedure below. Perform the program functions by following the menus in the STREAMLINE™ Display.

Note: *In these procedures the names of pushbutton selections which appear in the STREAMLINE™ Display menu will be enclosed in curved brackets,* { }, *and pushbuttons with dedicated functions will be enclosed in straight brackets,* [ ].

To move through the menu structure:

- Press the pushbutton below the desired selection in the STREAMLINE™ Display.
- Press [HOME/EXIT] to return to the previous menu.
- Press and hold [HOME/EXIT] for 1/2 second to return to the Main Menu.

Booting Up

1. Turn the power off using the switch at the front-left of the electronics frame (position "0").
2. Insert the floppy disk into the disk drive.

Table 5-6. Microprocessor Designations

Name	µProc.	µProcessor Function	EEPROMs
PANEL	U15	Control Panel CPU	U31, U32, U45, and U46
COMM	U78	Communications CPU	U1 and U2
TRANS	U58	Transform CPU	U12 and U13

3. Turn the power back on (position "1"). The disk drive light will come on for several seconds while the software is being loaded. When the disk drive is finished running, the display will light up with the main menu selections.

The System Software Disk

This is a detailed description of the System Software Disk menu selections. The Diagnostic Software Disk description is located after this subsection. For quick reference there are STREAMLINE™ Display menu trees in the appendix to this section.

After you have followed the instructions above under "Booting Up," the top level System Software menu will be displayed:

Prgrm Verify CPUs Reboot Vrsn

Select the pushbutton directly below a function to execute that function or to see the next level of menus.

{Prgrm}

Programming the EEPROMs

Use this selection to install a new version of system software.

- Press the pushbutton below the {Prgrm} menu selection. You will be prompted with selections to allow you to program all three microprocessor sections with the version of software in the System Software Disk.

{Verify}

Comparing Software

This selection is useful for determining the integrity of the software in the EEPROMs or of the EEPROMs themselves.

- Press the pushbutton below the {Verify} menu selection. The software in the EEPROMs will be compared to that in the System Software Disk installed in the disk drive. The STREAMLINE™ Display will indicate whether the software was verified to match or there was an error detected.

{CPUs}

Individual CPU Diagnostics

Selecting {CPUs} in the top level menu will bring up another menu with the following choices:

Panel Comm Trans

Selecting one of these will present another menu which provides diagnostics selections for the CPU chosen:

Prgrm Verify *Lever Type Vrsn

*(Panel selection only)

{Prgrm}; as an individual CPU choice: This selection allows you to reprogram the EEPROMs of the CPU selected in the previous menu.

{Verify}; as an individual CPU choice: Pressing the pushbutton below this selection compares the software in the EEPROMs of the CPU selected to the System Software Disk in the disk drive. If a difference is found, you will be notified with an error message in the STREAMLINE™ Display.

{Lever}; a {Panel} submenu selection: This function appears only under the {Panel} selection of the previous menu. It is used to set the software to the mechanical limits of the lever arm hardware. This is a factory adjustment and should be made by qualified personnel only. This selection is useful for checking the proper function of the lever arm hardware.

{Type}; accessible only as an individual CPU choice: This selection allows you to determine which device types have been programmed into the system and to change the device types, if needed. Under this submenu are prompts and selections which will allow you to change the device type of each EEPROM. A detailed menu structure is shown in the appendix to this section.

{Vrsn}; as an individual CPU choice: This selection will cause the DPM-700 to check the current System Software version in the EEPROMs of the CPU section selected. The current version will be shown in the STREAMLINE™ Display. To change the version of software in the EEPROMs, you must use the System Software Disk (074750) that contains the version of software you need. Instructions are located earlier in this section.

{Reboot}

Rebooting the System Software

When you are finished with the System Software Disk, press the pushbutton below the {Reboot} selection. You will be reminded to eject the System Software Disk by pushing in the button on the front of the disk drive. Then press {Reboot} again and the DPM-700 will load the standard System Software from the EEPROMs.

{Vrsn}

Reading the Current Software Version

This selection will cause the DPM-700 to check the current System Software version in the EEPROMs. If there is any difference in versions of the three CPU sections, an error message will occur. Otherwise, the current version number will be shown in the STREAMLINE™ Display.

The Diagnostic Software Disk

This is a detailed description of the uses of the DPM-700 Diagnostic Software Disk (074751). The software on this disk can be used to examine various aspects of the three microprocessors and their associated hardware. You can use it to check system functions or perform diagnostics to isolate a problem. You can also verify or change certain user-definable software setups. For a quick reference of these functions, there are STREAMLINE™ Display menu trees in the appendix to this section.

After you have followed the instructions given earlier under "Booting Up," the top level Diagnostic Software menu will be displayed:

Panel Comm Trans Reboot

Selecting one of these functions by pressing the softkey directly below it will lead you to either the execution of a function or to more menus, as described in the following paragraphs.

{Panel}

Control Panel Diagnostics and Software Settings

The {Panel} selection gives you access to menus which check mechanical and electrical control panel functions, perform electronic diagnostics loops for troubleshooting, and check or reset software settings in the control panel. Press the pushbutton below this selection to produce the following menu:

Keys Lamps Knobs Beep Uarts Setup

{Keys}; performing keyboard diagnostics: This selection enables you to check every pushbutton on the control panel. When you press a pushbutton , the pushbutton lights up and the display indicates its location on the control panel and its name. The [HOME EXIT] pushbutton stays lit.

If the name is not displayed and the pushbutton doesn't light up, then check the pushbutton switch and replace if necessary, or contact GVG Customer Service.

If the displayed name doesn't match the pushbutton name, then refer to Figure 5-7, earlier in this section, to check whether the pushbuttons are all in the right place.

{Lamps}; a complete lamp check: Selecting this function brings up another menu which has two choices:

Full Single

When you select **{Full}**, all lamps on the control panel blink and all segments in the numeric displays light up. This will last for about one minute or until [HOME/EXIT] is pushed.

When you select **{Single}**, each lamp and each numeric display segment lights one at a time. This continues for about ten minutes or until [HOME/EXIT] is pushed.

If a lamp doesn't light, replace it according to the instructions under "Pushbutton Lamp Replacement" in this section. If it still doesn't light, a lamp driver or other circuitry has probably failed. For further assistance, contact GVG Customer Service.

If a numeric display segment doesn't light, there may be a bad display driver or a bad display. For further assistance, contact GVG Customer Service.

{Knobs}; checking knobs, lever, joystick, and power: Press the pushbutton below this choice to produce the following menu:

Soft Clip Gain Lever Jstick Power

The **{Soft}**, **{Clip}**, and **{Gain}** selections each provide a hex-code read-out in the STREAMLINE™ Display.

- {Soft} selects the "soft knob" located at the right side of the STREAMLINE™ EFFECTS CONTROLLER section of the control panel.

- {Clip} and {Gain} select the CLIP and GAIN knobs located in the lower right corner of the KEYER section on the control panel.

These knobs control a dual potentiometer configuration. The potentiometers overlap so that one provides control information while the other one is in the "dead space" between zero and full scale, providing continuous adjustment as the knob is turned. The two potentiometers are represented by "sin" and "cos" in the display, with hex-code information for each. The hex-codes represent the digital equivalent of the potentiometer voltages.

The **{Lever}** and **{Jstick}** selections also provide a read-out of hex-code values, in this case for the lever-arm and joystick controls on the control panel.

- {Lever} selects the lever arm in the TRANSITION section of the control panel. The changing lever arm output can be observed as the lever arm is moved through its range.
- {Jstick} selects the joystick, which is in the TRANSFORM section of the control panel. The three axes of the joystick are displayed as X, Y, and Z hex-code values.

Table 5-7 shows the approximate hex-code values you can expect to see when manipulating each control, with the appropriate pushbutton selected.

Table 5-7. Control Output Values

Control	Hex-Code Range
All Knobs	0x0000 to 0x0fff for sin and cos
Lever-arm	approx. 0x000 to 0x0fff
Joystick	X, Y, & Z axes: approx. 0x0800 (centered) approx. 0x0600 to 0x0a00 (extremes)

The **{Power}** selection displays "+5", "2.5", and "G" with a hex-code that corresponds to each voltage.

- "G" (ground) should read "0x0000."
- "+5" volts should read "0x0fff."
- "2.5" volts should read approximately "0x0800."

The controls use these voltages to produce control-position information. The value displayed when a control is selected is a percentage of "0x0fff."

When you adjust a control with its corresponding pushbutton selected, the hex-code value in the display should change. If the value does not change or if it appears to have severely limited range, select the {Power} pushbutton to see if the control voltages read correctly. If the readings are incorrect, then there may be a problem with the control power supply in the control panel or an A/D converter. Readings of "0x0000" might be an indication of a bad power supply. If all three values read "0x0fff", it's possible that the A/D converter is bad. For further assistance, please contact GVG Customer Service.

If the voltages under the {Power} selection are correct, then determine whether just one control is affected or if a particular group of controls is affected. If just one control has incorrect output readings, then the problem is probably in the control potentiometer. If a group of controls is affected, then the problem is probably located in a multiplexer common to those controls. Contact GVG Customer Service for further assistance.

{Beep}; testing the beeper: Pressing the pushbutton below the {Beep} selection will cause the beeper to sound for about one second. If the beeper doesn't sound then the beeper or its connecting circuitry may be at fault.

{Uarts}; troubleshooting loops and Uart diagnostics: The term "UART" refers to the devices which drive the serial communications ports on the back of the electronics frame. It stands for Universal Asynchronous Receiver Transmitter. Selecting {Uarts} from the STREAMLINE™ Display menu will produce another menu with two choices:

TTY Frame

When you select **{TTY}**, the following functions are performed on the communications loop between the Panel CPU and the TTY port (Figure 5-17).

When you select **{Frame}**, the following functions are performed on the communications loop between the Panel CPU and the Frame port (Figure 5-17).

Select either **{TTY}** or **{Frame}** to produce the following menu:

Remote Scope Local * TTY/Frame
*(One or the other is displayed)

Select **{Remote}** to run a loop-back communications test to either the TTY port or the Communication CPU at the Frame, depending on which was selected in the previous menu. The Panel CPU sends each of the 256 possible characters one at a time to the UART, which sends them on to the selected port.

- If {Frame} was selected in the previous menu, the data continues along the control panel cable to the frame UART which relays it to the Communication CPU. The Communication CPU returns the character received back along the same path to the Panel CPU, completing the loop.

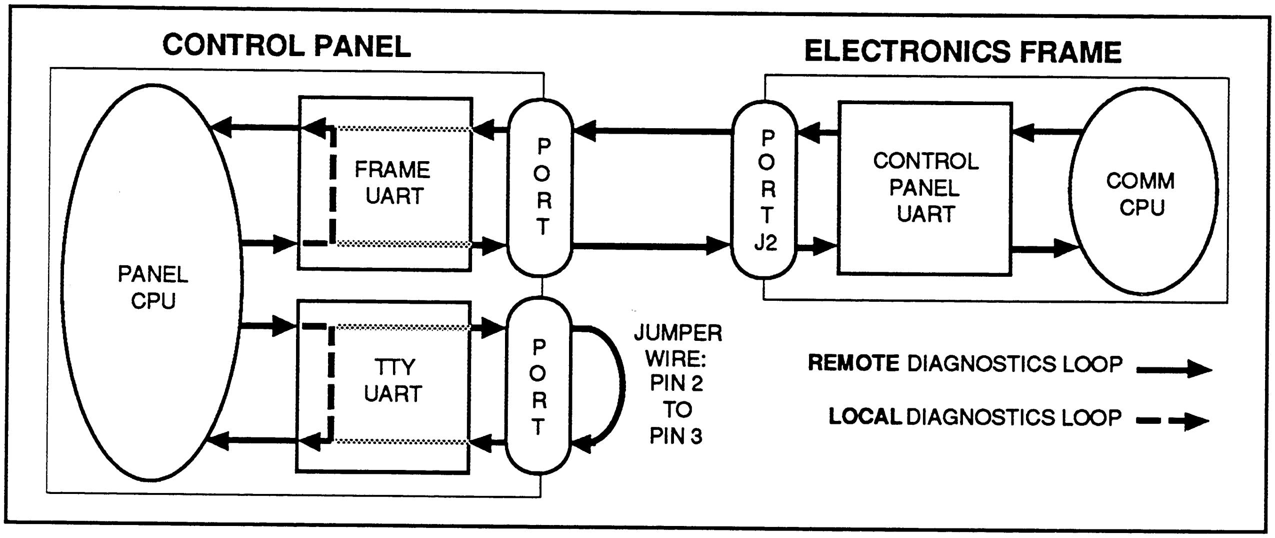

CONTROL PANEL
ELECTRONICS FRAME
PANEL CPU
FRAME UART
TTY UART
PORT
PORT
PORT J2
CONTROL PANEL UART
COMM CPU
JUMPER WIRE: PIN 2 TO PIN 3
REMOTE DIAGNOSTICS LOOP
LOCAL DIAGNOSTICS LOOP

Figure 5-17. Control Panel Diagnostics Loops

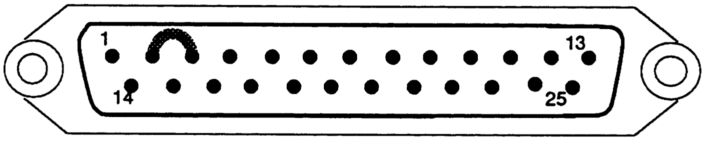
- If {TTY} was selected previously, you must disconnect the terminal and install a jumper from the receive pin to the transmit pin of the connector. This allows the signal to "loop-back" to the UART and the Panel CPU. Jumper pin 2 to pin 3 on the 25 pin D connector on the back of the control panel (see Figure 5-18).

- When all 256 characters have been sent and received successfully, the STREAMLINE™ Display will indicate that the test was passed. When a character fails to return, a failure will be indicated.

Select **{Scope}** for easier troubleshooting with an oscilloscope or other test equipment. If the system has failed the {Remote} or {Local} test, this mode is useful for looking at the signal along the communications loop until the source of the failure is located.

- This selection causes the system to run a continuous communications loop to either the TTY port or the Frame, as selected in the previous menu. A single character is sent repeatedly along the communications loop described under the {Remote} selection. The loop continues until [HOME/EXIT] is pushed.

BACK OF CONTROL PANEL:
TTY PORT



SIGNAL	PIN
GROUND	1,6,7
TX3	2
RX3	3

Figure 5-18. J4 TTY Diagnostics Jumper

- If {TTY} was selected previously, you will need to disconnect the terminal and install the jumper as shown in Figure 5-18.

Select **{Local}** to run a local UART diagnostics test.

- The Panel CPU sends each of the 256 possible characters, one at a time, to the appropriate UART (TTY or Frame), which in turn sends the characters back to the CPU. This exercises the UART, the address decoder, and the interrupt lines of the CPU. The STREAMLINE™ Display will indicate whether the test passed or failed.

Press the pushbutton below **{TTY}** or **{Frame}** to toggle between TTY and Frame functions at this menu level. This allows you to change the loop to be tested without backing up to the previous menu with the [HOME/EXIT] pushbutton.

{Setup}; setting or verifying user-definable program parameters: This branch of menu selections will allow you to verify or change certain software parameters or settings. All of the software parameters are set at the factory and you may never need to change them. This feature is provided in case any changes need to be made, and as a troubleshooting aid.

When you select {Setup}, the following menu is displayed:

EEPROM Lever LmpSvr Vrsn

The **{EEPROM}** selection gives you access to the device types of the control panel CPU EEPROMs. The device type of an EEPROM, for our purposes, is defined as the manufacturer and part number of the EEPROM. These are set at the factory and will probably never need to be changed. If an EEPROM is changed, however, it may be necessary to change its device type in the system programming.

- To do so, select the device by its locator designator: {U46}, {U32}, {U45}, or {U31}. The display will show the currently loaded manufacturer and part number for the selected EEPROM. You are given the option of responding with {Yes} or {No}.

- If you choose {Yes}, indicating that the device type displayed is correct, you will be returned to the previous menu to choose another device or to quit.

- If you choose {No}, then you will be given a list of manufacturers to choose from.

- After you select a manufacturer, a list of part numbers is presented. Select a part number and both the manufacturer and part number will be displayed and you are given a {Yes} or {No} choice. Choosing {No} will repeat the selection process just described. Choosing {Yes} will save the changes you have just made and return you to the locator designator list.

The **{Lever}** selection in this branch of the menu structure is for use by qualified personnel only. The same control information can be obtained using the {Knobs} branch of the menu explained earlier. This function allows for setting the stored minimum and maximum values of lever arm travel, which are used as references by the system software.

Select **{LmpSvr}** to set the lamp saver mode. This will be followed by a prompt: "Lamp Saver turns off in xx min." When the number of minutes indicated is 0 (default), the lamp saver mode is off. When a number of minutes other than 0 is indicated, the system will wait the indicated number of minutes after a control input (such as a button push or lever movement) and then turn off all of the panel lights. The STREAMLINE™ Display will indicate that the panel is in lamp saver mode. Pressing any pushbutton will restore normal operation. Set the minutes that you want the system to wait with the numeric keypad. Acceptable values are 0 to 999999, in whole numbers only.

Select **{Vrsn}** to display the current version of system software in the Panel EEPROMs. To change the version of software in the EEPROMs, you must use the System Software Disk (074750) that contains the version of software you need. Instructions are located earlier in this section.

{Comm}

Diagnostics and Software Settings for Communications

The {Comm} selection gives you access to menus which are used to check various communications functions, to perform electronic diagnostics loops for troubleshooting, and to check or set the software settings stored in the communication EEPROMs.

Serial port programming is done in this menu. A detailed description is provided under "Setting Communication Parameters" in the Installation Section of this manual.

Pressing the pushbutton below {Comm} in the STREAMLINE™ Display will produce a menu with the following functions:

GPIs TenXL DP Ram Uarts Setup

{GPIs}; checking the General Purpose Interface Functions: This selection allows you to check the circuits from the equipment triggering the GPI inputs and the circuits to the equipment triggered by the GPI outputs.

- When this function is selected, the STREAMLINE™ Display will indicate when a GPI input is being triggered or switched low. Each input is identified by its number, from 0 through 7.

***Note:** The display indication is active only while the input is pulled low; if the duration of the trigger is too short, the indication may not be visible on the display. In this case you will need to force the source low long enough to read the display indication.*

- In addition to the input test, the GPI output relays will close, one at a time, to check the circuits to the equipment being triggered by the GPI outputs. Any tallies or other GPI inputs connected to the DPM-700 should respond appropriately as the output relays close and open. The cycle will continue until you press [HOME/EXIT].

{TenXL}; testing the TTY/INPUT SELECTOR port communications: Selecting the pushbutton below {TenXL} will cause the DPM-700 to run a continuous diagnostics loop to a 10x1 input selector connected to the TTY/INPUT SELECTOR port. This involves only the input selector portion of the port. During this test, the input selector is cycled through each video input one at a time. This allows you to monitor the port with an oscilloscope or other test equipment to verify correct communications signals.

If your input selector has pushbuttons, the LEDs on the pushbuttons will light sequentially as the test runs. If not, you can verify the 10x1 input selector function by monitoring its video output and observing the video changing as the test runs. Refer to your input selector service manual for the communication data required for correct input selector function.

{DP Ram}; performing a Random Access Memory test: This selection will run a test on the dual port RAM which serves the communication and transform CPUs.

Note: *Performing this test will erase important information in the RAM. This includes E-MEM® data and system timing parameters. Save this data to a floppy disk if you have not already done so.*

For this test, the communication and transform CPUs write data to every other RAM address and then read it back. This checks out the address and data functions of the RAM. If a failure occurs, the CPU will continue to try to access the address involved indefinitely, allowing you to locate the problem. The seventh LED (CD7 or TD7) of either the communication or transform CPU will light on the front of the Frame Control Processor Module to indicate which CPU located the failure.

{Uarts}; performing UART diagnostics: The term "UART" refers to the devices which drive the serial communications ports on the back of the electronics frame. It stands for Universal Asynchronous Receiver Transmitter. Selecting {Uarts} will allow you to run diagnostics on each of the serial ports. The following menu choices will be displayed:

Frame   Uart2   Uart3   Uart4   Uart5   Uart6

These selections represent the UARTs that are assigned to the serial ports, as shown in Table 5-8. Pressing the pushbutton below any of these choices will display the following menu:

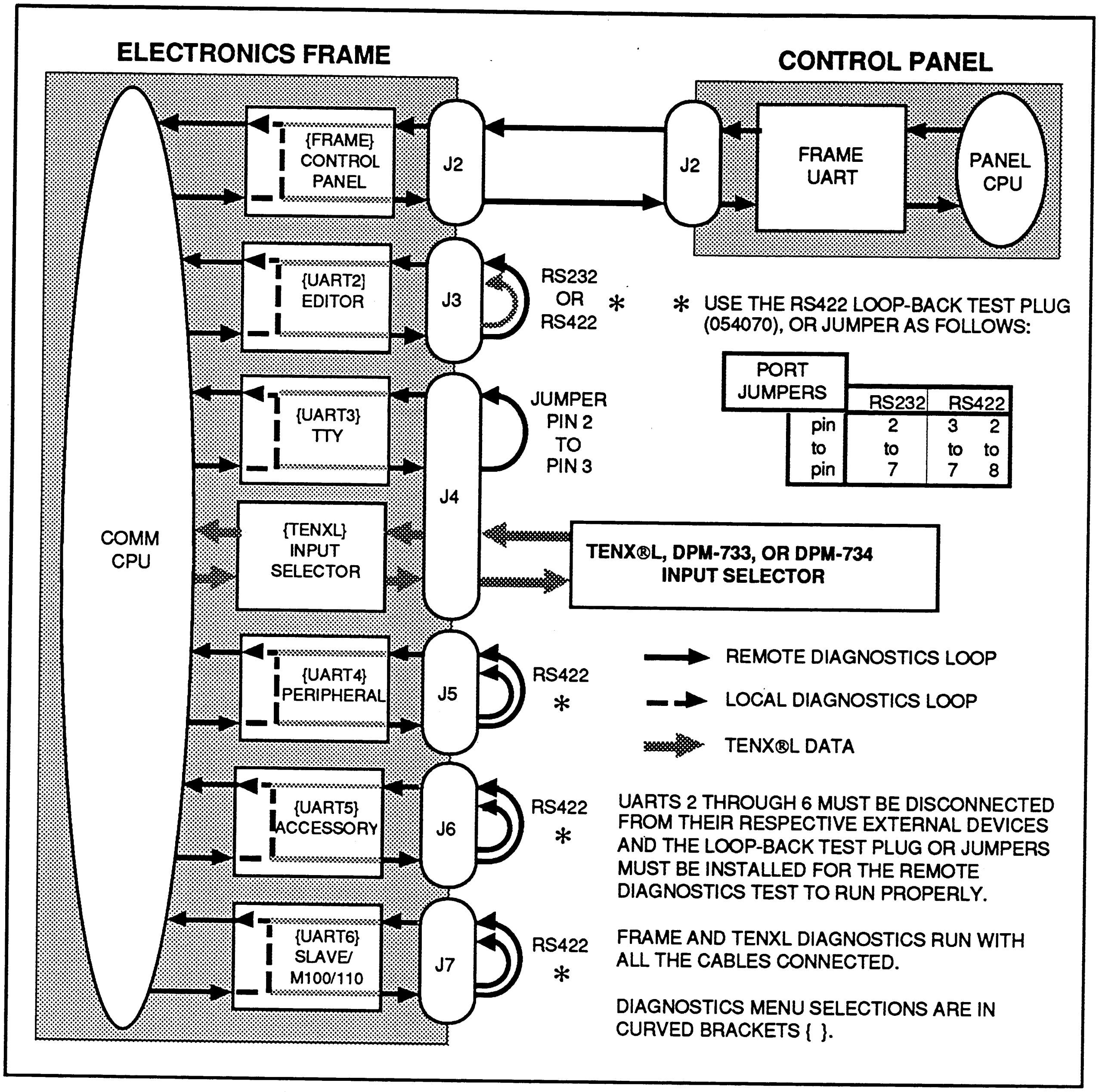
Remote   Scope   Local   *Uart(n-1)   Uart(n+1)*

Select **{Remote}** to run a remote loop-back test to the serial port selected in the previous menu. Except in the case of the {Frame} selection, it is necessary to disconnect any cables from the ports being tested and install the RS422 Loop-back Test Plug (054070) provided with the Spare Lamp and Fuse Kit. If your Editor Port is configured for RS232, or if the test plug is not available, you can install jumpers, as shown in Figure 5-20. The Comm CPU sends each of the 256 possible characters one at a time to the selected UART, which sends them on to its corresponding serial port (see Figure 5-19). In the case of the {Frame} selection, the Panel CPU is the source of the loop, as it is when the {Frame} selection is made in the {Panel} menu branch.

When you select **{Scope}**, the system runs a continuous communications loop to the port selected for the purpose of troubleshooting with an oscilloscope. If the system fails the {Remote} or {Local} test, this mode is useful for looking at the signal along the communications loop until the source of the failure is located. A single character is sent repeatedly along the communications loop described under the {Remote} selection. This will run until [HOME/EXIT] is pushed.

Table 5-8. UART Serial Port Assignments

Frame	Uart2	Uart3	Uart4	Uart5	Uart6
J2 Control Panel	J3 Editor	J4 TTY/Input Selector	J5 Peripheral	J6 Accessory	J7 Slave/ Model 100/110


ELECTRONICS FRAME
CONTROL PANEL
COMM CPU
{FRAME} CONTROL PANEL
J2
J2
FRAME UART
PANEL CPU
{UART2] EDITOR
J3
RS232 OR RS422 *
{UART3} TTY
JUMPER PIN 2 TO PIN 3
J4
{TENXL} INPUT SELECTOR
TENX®L, DPM-733, OR DPM-734 INPUT SELECTOR
{UART4} PERIPHERAL
J5
RS422 *
{UART5} ACCESSORY
J6
RS422 *
{UART6} SLAVE/ M100/110
J7
RS422 *
REMOTE DIAGNOSTICS LOOP
LOCAL DIAGNOSTICS LOOP
TENX®L DATA

* USE THE RS422 LOOP-BACK TEST PLUG (054070), OR JUMPER AS FOLLOWS:

PORT JUMPERS	RS232	RS422	
pin	2	3	2
to	to	to	to
pin	7	7	8

UARTS 2 THROUGH 6 MUST BE DISCONNECTED FROM THEIR RESPECTIVE EXTERNAL DEVICES AND THE LOOP-BACK TEST PLUG OR JUMPERS MUST BE INSTALLED FOR THE REMOTE DIAGNOSTICS TEST TO RUN PROPERLY.

FRAME AND TENXL DIAGNOSTICS RUN WITH ALL THE CABLES CONNECTED.

DIAGNOSTICS MENU SELECTIONS ARE IN CURVED BRACKETS { }.

Figure 5-19. Frame Diagnostics Loops

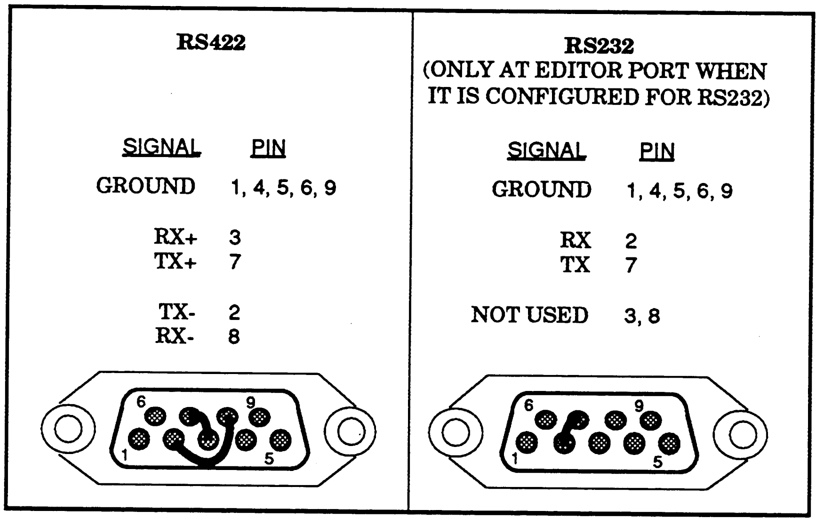
Select **{Local}** to run a local UART diagnostics test. The Comm CPU sends each of the 256 possible characters, one at a time, to the selected UART, which in turn sends the characters back to the CPU. This tests the UART, the address decoder, and the interrupt lines of the CPU. The STREAMLINE™ Display will indicate whether the test passed or failed.

{***Uart(n-1)***} and {***Uart(n+1)***} represent actual choices that vary according to which UART was selected. These are useful for changing to an adjacent UART without returning to the previous menu. For example, if {Uart2} was selected then the actual choices will be {Frame} and {Uart3}. If {Frame} is the current UART selected then the menu displayed will be:

Remote Scope Local Uart6 Uart2

{Setup}; verifying and setting Communication software parameters: There are certain software parameters which are user-definable. These can be set using selections found in this menu branch. They include the device types of the Communication CPU EEPROMs and the software parameters which determine the functions of the serial ports. Press {Setup} to bring up the next menu:

EEPROM USetup Vrsn



RS422

SIGNAL	PIN
GROUND	1, 4, 5, 6, 9
RX+	3
TX+	7
TX-	2
RX-	8

RS232
(ONLY AT EDITOR PORT WHEN IT IS CONFIGURED FOR RS232)

SIGNAL	PIN
GROUND	1, 4, 5, 6, 9
RX	2
TX	7
NOT USED	3, 8

Figure 5-20. Serial Port Diagnostics Jumpers

The **{EEPROM}** selection gives you access to the device types of the Communication CPU EEPROMs. The device type of an EEPROM is defined as its manufacturer and part number. These are set at the factory and will probably never need to be changed. If an EEPROM is replaced, however, it may be necessary to change its device type in the system programming.

- To do so, select the device by its locator designator: {U1} or {U2}. The display will show the currently loaded manufacturer and part number for the selected EEPROM. You are given the option of responding with {Yes} or {No}.
- If you choose {Yes}, indicating that the device type displayed is correct, you will be returned to the previous menu to choose another device or to quit.
- If you choose {No}, then you will be given a list of manufacturers to choose from.
- After you select a manufacturer, a list of part numbers is presented. After you choose a part number, the display will show the new manufacturer and part number, and you will be given a {Yes} or {No} choice. Choosing {No} will repeat the selection process just described. Choosing {Yes} will save the changes you have just made and return you to the device list.

{USetup} is short for UART Setup. Four of the serial ports on the back of the DPM-700 electronics frame can be programmed to operate in any of the communication protocols available for the system. For complete information on the protocols and the serial ports, please see "Serial Interface Ports" in the Installation section of this manual.

For complete instructions on how to use the {USetup} menu branch, see "Setting Communication Parameters" in the Installation Section of this manual. For a quick reference, see the {Comm} Menu Tree in the appendix to this section.

The **{Vrsn}** selection displays the current version of software loaded into the communication CPU's EEPROMs. To change the version of software in the EEPROMs, you must use the System Software Disk (074750) that contains the version of software you need. Instructions are located earlier in this section.

{Trans}

Verifying and Setting Transform Software Parameters

This selection has the fewest functions of the three main menu choices of the Diagnostic Software Disk. It is concerned exclusively with the Transform CPU's EEPROMs and their parameters. The menu that follows this selection consists of two choices:

EEPROM **Vrsn**

The **{EEPROM}** selection gives you access to the device types of the Transform CPU EEPROMs. These are set at the factory and will probably never need to be changed. If an EEPROM is changed, however, it may be necessary to change its device type in the system programming.

- To do so, select the device by its locator designator, {U12} or {U13}. The display will show the currently loaded manufacturer and part number for the selected EEPROM. You are given the option of responding with {Yes} or {No}.
- If you choose {Yes}, indicating that the device type displayed is correct, you will be returned to the previous menu to choose another device or to quit.
- If you choose {No}, you will be given a list of manufacturers to choose from.
- After you select a manufacturer a list of part numbers is presented. After you choose a part number the display will show the new manufacturer and part number, and you will be given a {Yes} or {No} choice. Choosing {No} will repeat the selection process just described. Choosing {Yes} will save the changes you have just made and return you to the device list.

Select **{Vrsn}** to display the current version of software loaded into the transform CPU's EEPROMs. To change the version of software in the EEPROMs, you must use the System Software Disk (074750) that contains the version of software you need. Instructions are located earlier in this section.

{Reboot}

Reloading the Operating Software

When you are finished using the Diagnostic Software Disk, this selection directs you in rebooting the DPM-700 System with the operating software. When you press {Reboot}, you will be prompted to remove the Diagnostic Software Disk and then press {Reboot} again. The system will then reload its standard operating software from the EEPROMs.

Software Updates

There will be new versions of system software and diagnostics software released from time to time. These will contain enhancements of features and operational characteristics which may be of benefit to you. If you would like to receive updates that you are entitled to under your warranty or would like to be notified when new versions become available for purchase, be sure you fill out your DPM-700 REGISTRATION CARD located in the front of this manual.

Maintenance Appendix

DISK ERROR MESSAGES

If you use your DPM-700 disk drive frequently you will find that there is a wide variety of operations that can be performed. To make your operation of the disk drive as simple as possible the system will display a message in the STREAMLINE™ Display when any errors are encountered.

Disk Error	Indicates that the disk has been damaged or otherwise corrupted.
Disk Busy	Occurs when the disk drive is running and other selections are made from a STREAMLINE™ Display menu to use the disk drive.
Not a Directory	Indicates that you have entered a name for a directory that doesn't exist on the floppy disk.
No Such File	Indicates that you have entered a name for a file that doesn't exist on the floppy disk.
Disk is Write Protected	The write-protection tab in the corner of the floppy disk has been set to prevent writing to the disk.
File is a Directory	The filename you have entered is the name of a directory on the floppy disk.
File is Write Protected	The file you tried to write to has been write protected.
No Disk	This message is displayed when any disk functions are selected from the main menu and there is no floppy disk in the disk drive.
File Exists	The filename you entered for the file you are renaming already exists in the floppy disk directory.

I/O Error	Indicates a disk drive or disk drive controller error. Probably caused by a hardware failure.
Disk Timeout	The frame to panel communications link has exceeded the alloted time limit for a reply.
No DDP Buffers	No more buffers are available for frame to panel communications. (DDP stands for Data Delivery Protocol.)
Bad DDP Buffer	The frame to panel communications link has detected a buffer failure.
No Space	The floppy disk in the disk drive is full.
E-MEM® Locked	Indicates that an E-MEM® function was selected while an E-MEM® function was already running. Only one function can run at a time.
Invalid Header	The System Software Disk in the disk drive has bad data. Use another System Software Disk.
Disk is Unformatted	The floppy disk in the disk drive is either unformatted or it contains the wrong formatting. Formatting the disk will destroy any information that was already on the disk.
Wrong Version	Occurs when you try to load a file that was created with a newer version of software than is loaded in the system EEPROMS.
Data Checksum	Displayed after a frame to panel communications checksum has failed repeatedly.
Serial Port Timeout	The frame to switcher communications link for an E-MEM® save or recall function has exceeded the alloted time limit for a reply.
File Error	An error has occurred that doesn't have a specific error message assigned.

DIAGNOSTICS MENU TREES

The System Software Disk and the Diagnostic Software Disk contain utility programs that are useful in setup, verification, and diagnostics of the DPM-700 system. You can load the programs to run on the DPM-700 by following the "Booting Up" procedure below.

The System Software Disk contains some of the diagnostics and setup functions that are on the Diagnostics Software Disk, plus it contains the system operating software and the programming to load the software into the system EEPROMs.

The Diagnostics Disk has all of the setup and diagnostics functions that are on the System Software Disk and more, so it is the disk to use when performing diagnostics on the DPM-700.

The following pages contain menu trees that represent the menu structure you will find when using the System and Diagnostic Software Disks. The four menu trees shown are:

- Figure MA-1. System Software Menu Tree
- Figure MA-2. Diagnostic Software Panel Menu Tree
- Figure MA-3. Diagnostics Software Comm Menu Tree
- Figure MA-4. Diagnostic Software Trans and Reboot Menu Tree

Using the Disks

Booting Up

1. Turn the power off using the switch at the front-left of the electronics frame (position "0").
2. Insert the floppy disk into the disk drive.
3. Turn the power back on (position "1"). The disk drive light will come on for several seconds while the software is being loaded. When the disk drive is finished running, the display will light up with the main menu selections.

Using the Menus

To move through the menu structure:

- Press the pushbutton below the desired selection in the STREAMLINE™ Display.
- Press [HOME/EXIT] to return to the previous menu.
- Press and hold [HOME/EXIT] for one second to return to the Main Menu.

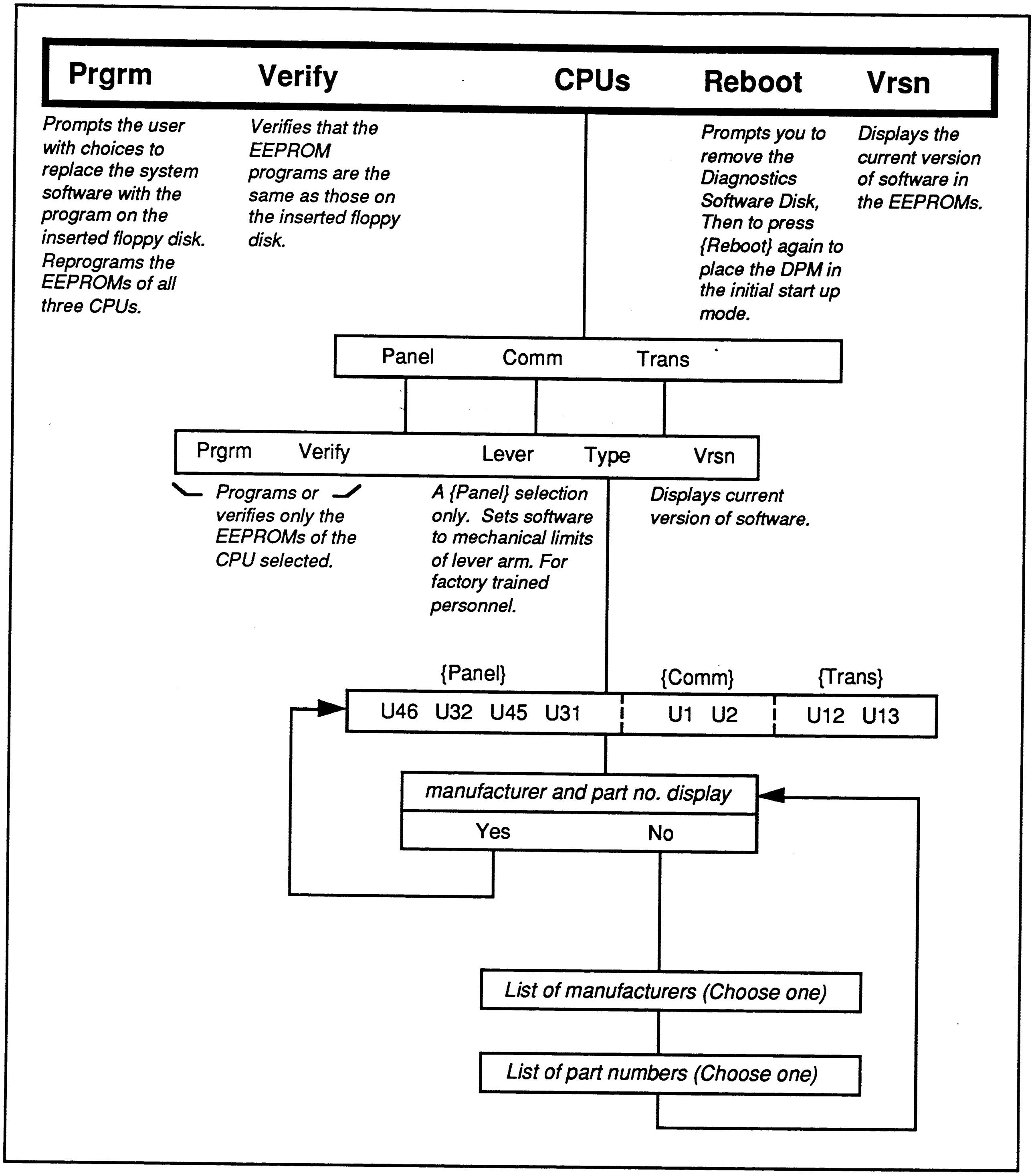

Prgrm
Verify
CPUs
Reboot
Vrsn
Prompts the user with choices to replace the system software with the program on the inserted floppy disk. Reprograms the EEPROMs of all three CPUs.
Verifies that the EEPROM programs are the same as those on the inserted floppy disk.
Prompts you to remove the Diagnostics Software Disk, Then to press {Reboot} again to place the DPM in the initial start up mode.
Displays the current version of software in the EEPROMs.
Panel
Comm
Trans
Prgrm
Verify
Lever
Type
Vrsn
Programs or verifies only the EEPROMs of the CPU selected.
A {Panel} selection only. Sets software to mechanical limits of lever arm. For factory trained personnel.
Displays current version of software.
{Panel}
{Comm}
{Trans}
U46 U32 U45 U31
U1 U2
U12 U13
manufacturer and part no. display
Yes
No
List of manufacturers (Choose one)
List of part numbers (Choose one)

Figure MA-1. System Software Menu Tree

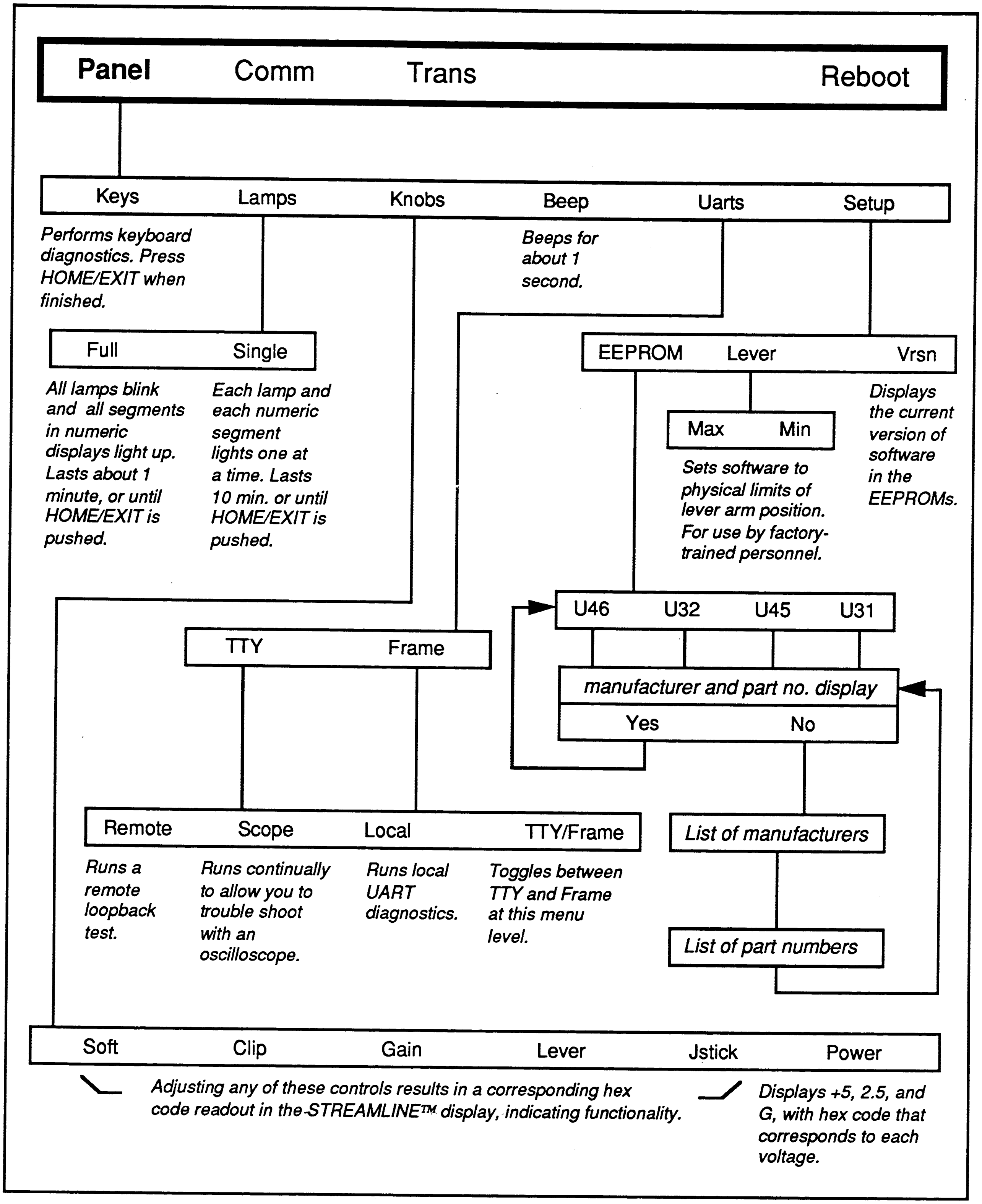
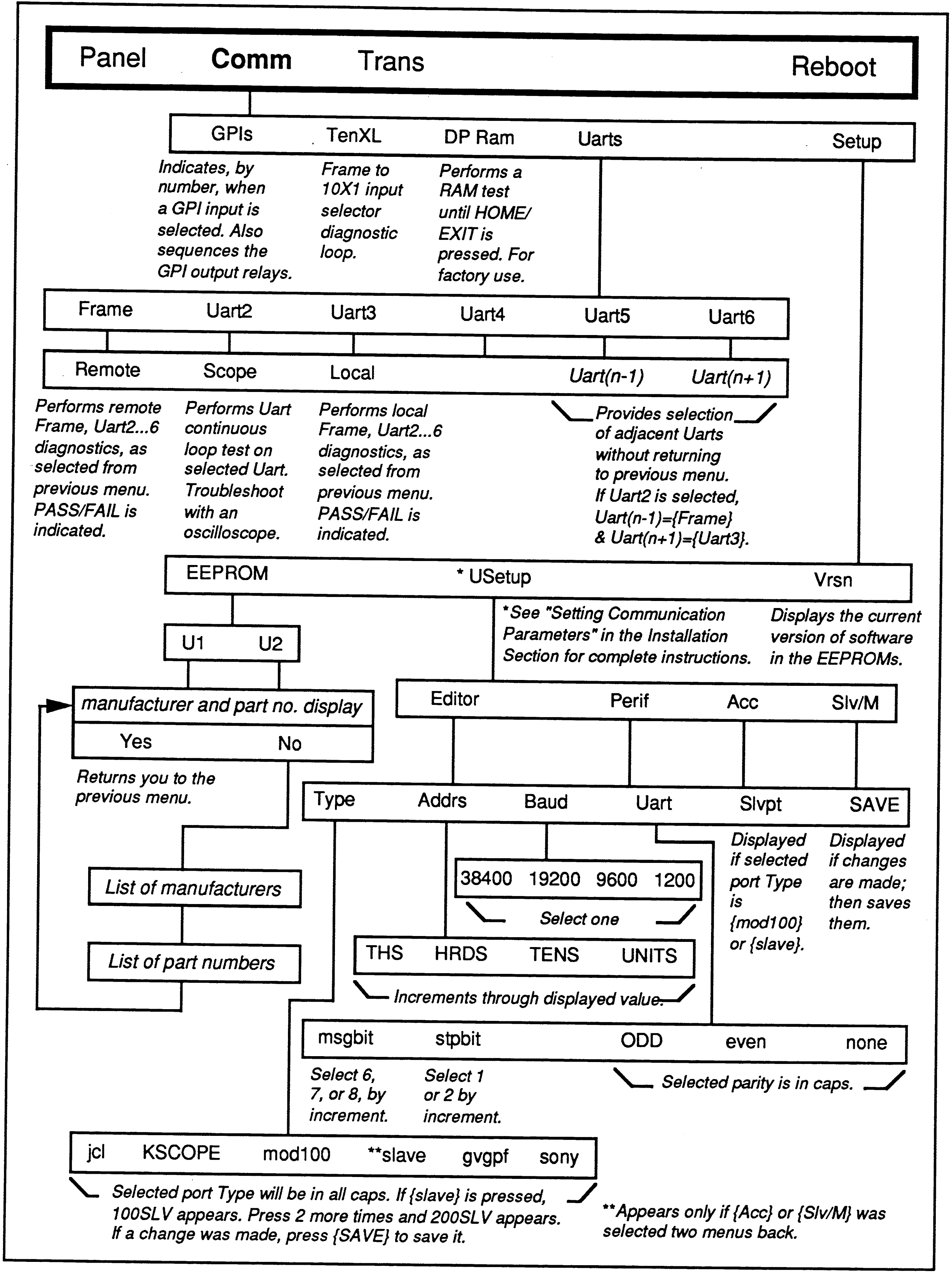

Panel
Comm
Trans
Reboot
Keys
Lamps
Knobs
Beep
Uarts
Setup
Performs keyboard diagnostics. Press HOME/EXIT when finished.
Beeps for about 1 second.
Full
Single
All lamps blink and all segments in numeric displays light up. Lasts about 1 minute, or until HOME/EXIT is pushed.
Each lamp and each numeric segment lights one at a time. Lasts 10 min. or until HOME/EXIT is pushed.
EEPROM
Lever
Vrsn
Max
Min
Sets software to physical limits of lever arm position. For use by factory-trained personnel.
Displays the current version of software in the EEPROMs.
U46
U32
U45
U31
manufacturer and part no. display
Yes
No
TTY
Frame
Remote
Scope
Local
TTY/Frame
Runs a remote loopback test.
Runs continually to allow you to trouble shoot with an oscilloscope.
Runs local UART diagnostics.
Toggles between TTY and Frame at this menu level.
List of manufacturers
List of part numbers
Soft
Clip
Gain
Lever
Jstick
Power
Adjusting any of these controls results in a corresponding hex code readout in the STREAMLINE™ display, indicating functionality.
Displays +5, 2.5, and G, with hex code that corresponds to each voltage.

Figure MA-2. Diagnostic Software—Panel Menu Tree


Panel
Comm
Trans
Reboot
GPIs
TenXL
DP Ram
Uarts
Setup
Frame
Uart2
Uart3
Uart4
Uart5
Uart6
Remote
Scope
Local
Uart(n-1)
Uart(n+1)
EEPROM
* USetup
Vrsn
U1
U2
manufacturer and part no. display
Yes
No
List of manufacturers
List of part numbers
Editor
Perif
Acc
Slv/M
Type
Addrs
Baud
Uart
Slvpt
SAVE
38400
19200
9600
1200
THS
HRDS
TENS
UNITS
msgbit
stpbit
ODD
even
none
jcl
KSCOPE
mod100
**slave
gvgpf
sony

Indicates, by number, when a GPI input is selected. Also sequences the GPI output relays.

Frame to 10X1 input selector diagnostic loop.

Performs a RAM test until HOME/EXIT is pressed. For factory use.

Performs remote Frame, Uart2...6 diagnostics, as selected from previous menu. PASS/FAIL is indicated.

Performs Uart continuous loop test on selected Uart. Troubleshoot with an oscilloscope.

Performs local Frame, Uart2...6 diagnostics, as selected from previous menu. PASS/FAIL is indicated.

Provides selection of adjacent Uarts without returning to previous menu. If Uart2 is selected, Uart(n-1)={Frame} & Uart(n+1)={Uart3}.

**See "Setting Communication Parameters" in the Installation Section for complete instructions.*

Displays the current version of software in the EEPROMs.

Returns you to the previous menu.

Select one

Increments through displayed value.

Displayed if selected port Type is {mod100} or {slave}.

Displayed if changes are made; then saves them.

Select 6, 7, or 8, by increment.

Select 1 or 2 by increment.

Selected parity is in caps.

Selected port Type will be in all caps. If {slave} is pressed, 100SLV appears. Press 2 more times and 200SLV appears. If a change was made, press {SAVE} to save it.

***Appears only if {Acc} or {Slv/M} was selected two menus back.*

Figure MA-3. Diagnostics Software—Comm Menu Tree

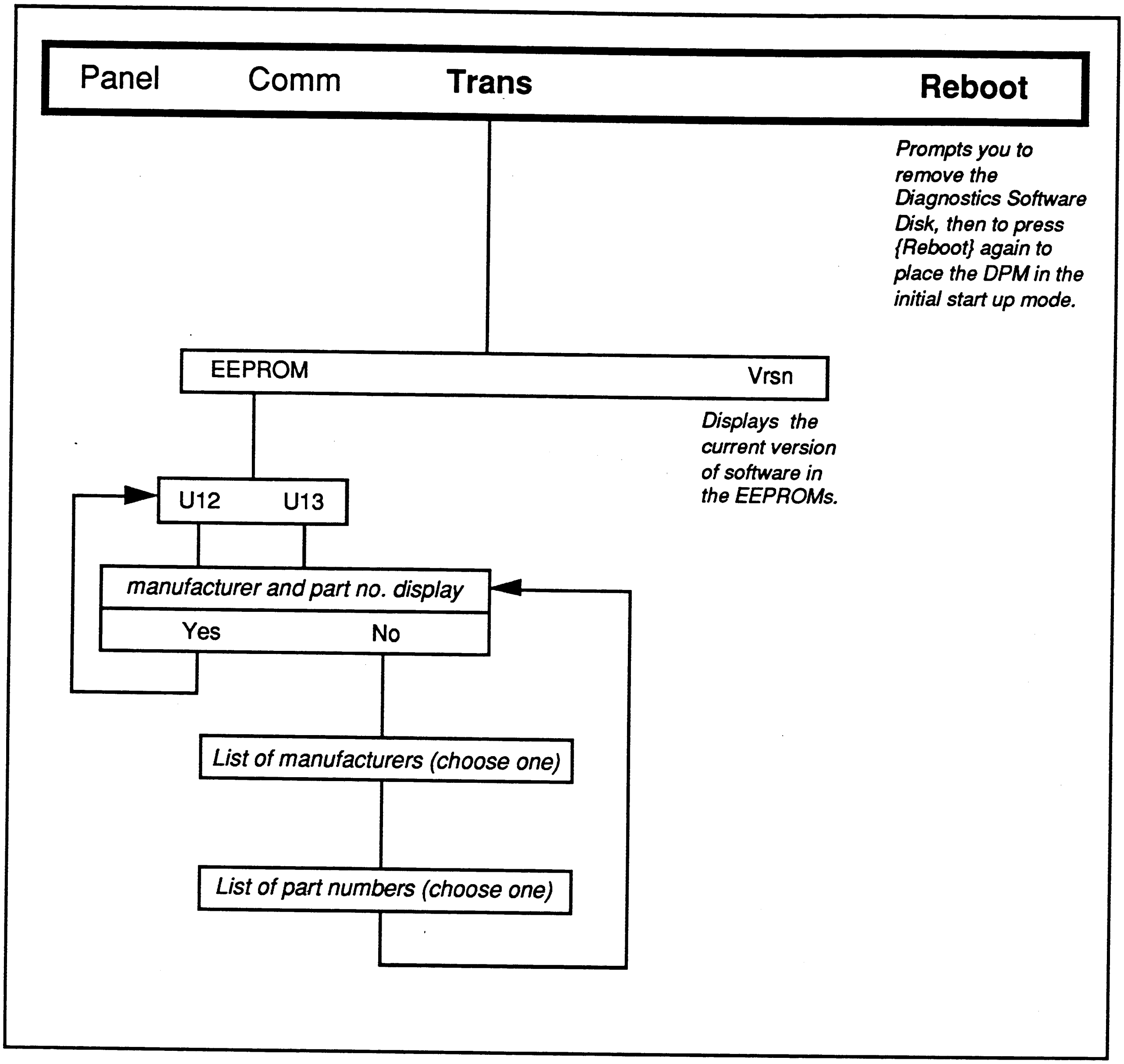

Panel
Comm
Trans
Reboot
Prompts you to remove the Diagnostics Software Disk, then to press {Reboot} again to place the DPM in the initial start up mode.
EEPROM
Vrsn
Displays the current version of software in the EEPROMs.
U12
U13
manufacturer and part no. display
Yes
No
List of manufacturers (choose one)
List of part numbers (choose one)

Figure MA-4. Diagnostic Software—Trans and Reboot Menu Tree

Section 6
Parts Lists

INTRODUCTION

This section includes parts lists for the DPM-700. The parts lists are listed in Table 6-1 in ascending order by assembly number, under subject headings. If you need spare parts for the DPM-700 a spare parts kit (91-084773) and a spare lamp and fuse kit (074712) are available.

REPLACEMENT PARTS

Many components used in this equipment are standard parts which may be purchased locally. When replacing standard electronic components, be sure they meet or exceed the specifications of the original part.

Because alternate parts suppliers are sometimes used, some electrical parts in your equipment may be different from those described in the parts list. The parts used will in no way alter or compromise the performance or reliability of the equipment. They are installed when necessary to ensure prompt delivery. Order replacement parts from the parts lists.

You can order replacement parts from your nearest GVG representative or send your order directly to:

The Grass Valley Group, Inc.
P.O. Box 1114
Grass Valley, CA 95945

Identify each part by the part or type number given in the parts list. Also include the full module or assembly number where the part is to be used.

NOTE: Some integrated circuits are programmed parts. These parts may include a program assembly number next to the U number in the parts list (e.g. 054128-00). Please use this assembly number when ordering replacement ICs.

GVG Part Numbering System

Manufactured Parts

Refer to Figure 6-1. GVG manufactured parts (or assemblies) are identified by a 6-digit assembly number, followed by a 2-digit version number (e.g., 095123-01). All eight characters properly identify a part.

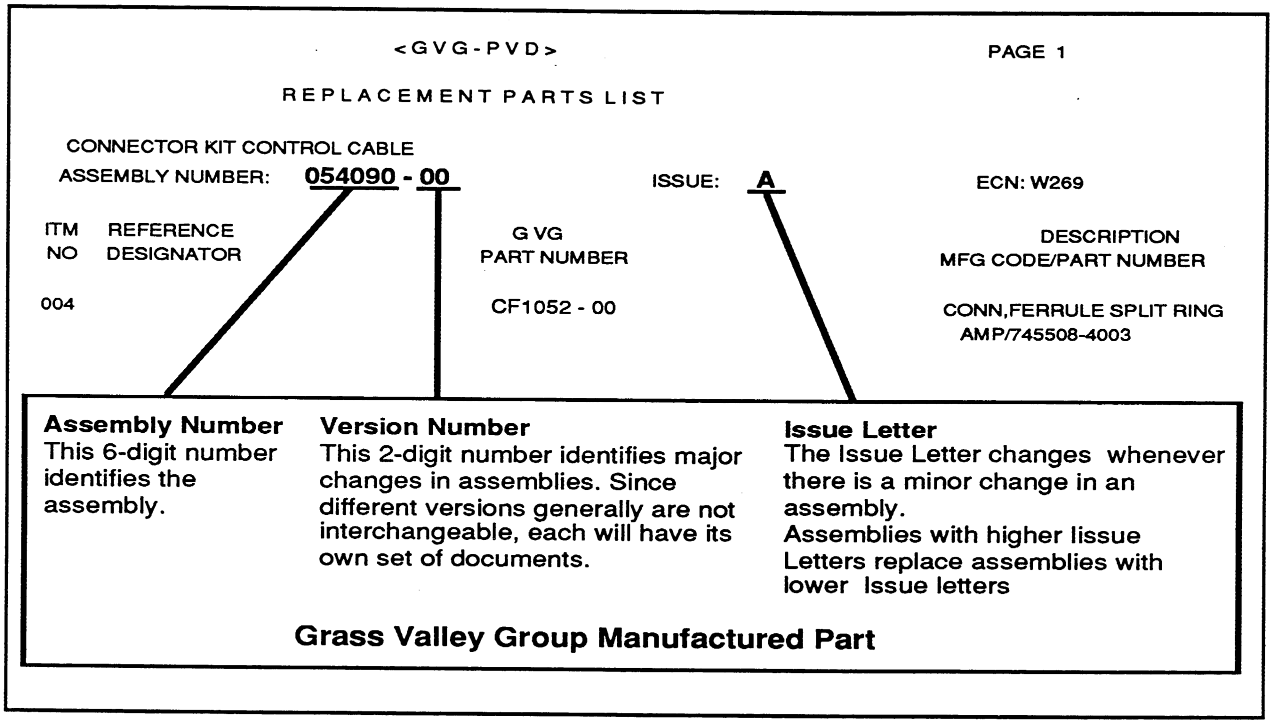
- The 2-digit version number changes whenever there has been a major change in an assembly. Assemblies with different version numbers may not be interchangeable and have their own unique sets of documentation. For example, the Replacement Parts List for an 064700-00 module doesn't apply to an 064700-01 module.

An issue letter identifies a minor change in an assembly. Assemblies with higher issue letters can be used to replace those with lower letters. For example, an assembly with an issue letter of D1 will replace an assembly with an issue letter of A1.

Purchased Parts

GVG purchased parts are identified by two letters followed by 6 numbers (e.g., KA4025-01). All eight characters properly identify a part. Refer to Figure 6-2.

- The letters define the part classification (KA = knob).
- The next four digits are the part number.
- The last two digits are the version of the basic part number.



<GVG-PVD> PAGE 1

REPLACEMENT PARTS LIST

CONNECTOR KIT CONTROL CABLE
ASSEMBLY NUMBER: 054090 - 00 ISSUE: A ECN: W269

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER
004		CF1052 - 00	CONN,FERRULE SPLIT RING AMP/745508-4003

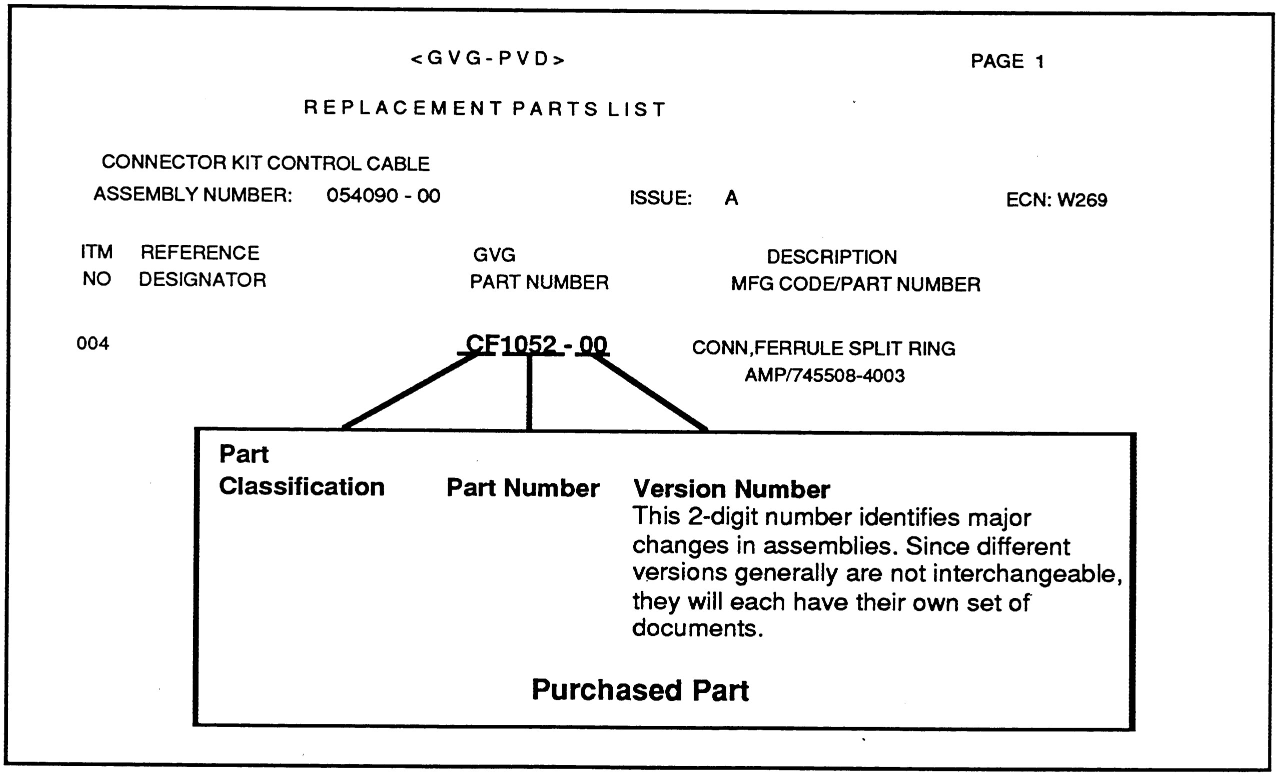
Assembly Number
This 6-digit number identifies the assembly.

Version Number
This 2-digit number identifies major changes in assemblies. Since different versions generally are not interchangeable, each will have its own set of documents.

Issue Letter
The Issue Letter changes whenever there is a minor change in an assembly.
Assemblies with higher lissue Letters replace assemblies with lower Issue letters

Grass Valley Group Manufactured Part

Figure 6-1. GVG Manufactured Parts



<GVG-PVD> PAGE 1

REPLACEMENT PARTS LIST

CONNECTOR KIT CONTROL CABLE
ASSEMBLY NUMBER: 054090 - 00 ISSUE: A ECN: W269

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER
004		CF1052 - 00	CONN,FERRULE SPLIT RING AMP/745508-4003

Part Classification

Part Number

Version Number
This 2-digit number identifies major changes in assemblies. Since different versions generally are not interchangeable, they will each have their own set of documents.

Purchased Part

Figure 6-2. Purchased Parts

Table 6-1. DPM-700 Parts Lists

Assembly Number	Assembly Name
Cables	
054700-00	Cable, Ribbon Switch Bd To CPU
054701-00/01/10	Cable Ribbon, Disk Drv To CPU 34 cnt
054702-00/01/10	Cable, Power Disk Drv To CPU 4 cnt
054703-00	Cable, Ribbon Lever Arm To Sw Bd 3 cnt
054704-00	Cable, Ribbon E-MEM To Sw Bd 26 cnt
054705-00	Cable, Power Display To Sw Bd 12 cnt
054708-10	Harness, Power Supply
054709-00	Cable, Pwr Switch Bd To CPU 6 cnt
054717-00	Cable, Kit
054717-10	Cable, Control, 10 meters
054717-30	Cable, Control, 30 meters
054717-99	Cable, Control, 100 meters
Modules	
064700-03	Frame Control Processor
064702-03	Interface Module, NTSC
064703-01	Recursive Memory Module, NTSC
064703-10	Recursive Memory Module, PAL
064704-01	Second Channel Combiner Mezzanine
064705-01	Analog Input Submodule, NTSC
064708-00	Digital Extender Board Connections
064709-00	Control Panel Switch Board
064710-00	Control Panel Processor
064711-00	Panel Display & EMEM Board
064713-00	Analog Extender Board Connections
064716-01	Interior Motherboard
064717-01	Exterior Mother Board
064722-00	Interface Module, PAL
064726-00	Digital Input Submodule, NTSC
064727-00	Digital Input Submodule, PAL
064731-00	Static Ram Mezzanine, NTSC
064731-10	Static Ram Mezzanine, PAL
064732-00	Recursive Memory Ram Mezzanine, NTSC
064732-10	Recursive Memory Ram Mezzanine, PAL
064735-00	Analog Input Submodule, PAL
064741-00	Multi StandardVideo Channel, NTSC
064741-10	Multi Standard Video Channel, PAL
064742-00	3D RAG Mezzanine, NTSC
064742-10	3D RAG Mezzanine, PAL
064743-00	Filter Control Mezzanine, NTSC
064743-10	Filter Control Mezzanine, PAL

Table 6-1. DPM-700 Parts Lists

Assembly Number	Assembly Name
Assemblies	
074704-00	Lever Arm Assembly
074705-00	Joystick Assembly
074707-10	Power Supply
074719-00	Front Cover Assembly
074721-00	Fan Assembly
074725-01	Motherboard Assembly
074743-00	Lens Set
084770-00	Control Panel
084777-00	Frame Electronics , NTSC
084777-10	Frame Electronics, PAL
Options	
084705-50	NTSC Recursive Memory Option
084713-00	PAL Recursive Memory Option
084717-01	Rack /Disk Remote Option
084718-01	Control Panel Rack-Mount Option
084719-00	Extender Option
084750-00	1 Channel NTSC DPM-100/700 Conversion Kit
084751-00	2 Channel NTSC DPM-100/700 Conversion Kit
084752-00	1 Channel PAL DPM-100/700 Conversion Kit
084753-00	2 Channel PAL DPM-100/700 Conversion Kit
084764-00	2nd Channel Analog Option, NTSC
084764-10	2nd Channel Analog Option, PAL
084765-00	2nd Channel D2 Option, NTSC
084765-10	2nd Channel D2 Option, PAL
084768-00	Analog Composite NTSC Spare Module Kit
084768-10	Analog Composite PAL Spare Module Kit
084769-00	Digital Composite NTSC Spare Module Kit
084769-10	Digital Composite PAL Spare Module Kit
Power Supply	
PE1198-00	Deltron Power Supply
Spare Parts Kits	
074707-10	Spare Power Supply and Harness
074712-00	Spare Lamp, Fuse, and Connector Kit
084758-00	Spare Program and Diagnostics Disks
91-084732-00	Spare Parts Kit, All versions

MANUFACTURERS ABBREVIATION LIST

AB	Allen Bradley Co.
ACE	Ace Radio Control, Inc.
ADC	ADC Products
AEH	Amatom Electronic Hardware Co.
AHA	Aham Heat Sink
AIR	Airpax Electronics
ALC	Allied Control Co., Inc.
ALD	Allied Devices
ALE	Alco Electronic Products
ALL	Allen Mfg. Co.
ALP	Alpha Wire Corp.
ALT	Altec Lansing
AMA	Amatron
AMC	Amperex Electronic Corp.
AMD	Advanced Micro Devices Inc.
AMP	AMP, Inc.
ANA	Analog Devices
ANL	Anderson Laboratories
APH	Amphenol
ARC	Arco Electronics
ARH	Arrow Hart
ASC	Associated Spring Co.
ATC	Atlee Corp.
ATL	Atlas
AUE	Automatic Electric Co.
AUG	Augat, Inc.
AVT	The Avtel Corp.
BAR	Barnes Corp.
BC	Burroughs Corp.
BDR	Brand Rex Div. Am. Enka Corp.
BEF	Bel Fuse, Inc.
BEI	Bussco Engineering, Inc.
BEK	Beckman Insts., Helipot Div.
BEL	Beldon Corp.
BER	Berkley
BEY	Beyer Dynamic
BIR	Birtcher Corp., Industrial Div.
BIS	Bishop Graphics
BOR	Bourns
BOY	Boyd Industrial Rubber
BRN	Birnbach Co., Inc.
BUC	Buchanan Electrical Prod.
BUR	Burndy Corp.
BUS	Bussman Mfg.
CAC	Camcar Screw & Mfg.
CAK	Calmark Corp.
CAL	Callins Capacitors
CAM	Cambridge Therm. (Cambion)
CAN	Cannon, ITT
CAP	Caplugs
CAR	Carling Electric, Inc.
CDC	Continental Device Corp.
CEN	Centralab
CHE	Cherry Electrical Products
CHM	Chicago Miniature Lamp Works
CHS	Chicago Switch
CIN	Cinch Mfg. Co.
CIR	Circuit Structures Lab
CKC	C & K Components, Inc.
CLA	Clarostat Mfg. Co.
CLE	Clevite
CLR	C.P. Clare
CLX	Clairex
CNW	Continental Wirt Electronics
COD	Cornell-Dubilier Electronics
COM	Components, Inc.
CON	Connor Spring & Mfg. Co.
COR	Corning Glass Works
CPC	Clare Pendar Co.
CRM	Corcom Inc.
CTD	Chassis-Trak Division
CTK	CTS Knights, Inc.
CTS	CTS Corp.
CUT	Cutler-Hammer, Inc.
DAB	Daburn Electronics & Cable
DAC	Datel
DAG	Dage Electric Co.
DAL	Dale Electronics, Inc.
DAT	Datron Systems
DCE	D - Cemco Inc.
DDD	Data Delay Devices
DEC	Digital Equipment Corp.
DEL	Delevan Electronics
DEU	Deutsch Fasteners
DIA	Dialight Corp.
DIG	Digitran
DIX	Dixon, Inc.
DKY	Dow-Key
DRL	Driv-Loc
DSI	Datel Systems Inc.
DUN	Duncan
EA	Electronic Arrays Inc.
ECC	Engineering Components Co.
EEC	Electronic Engineering Co.
EHU	Electronics Hardware Unlimited
ELC	Elco Corp.
ELD	Eldema
ERI	Erie Technological Products
EYT	Eaton Yale & Towne
FAI	Fairchild Semiconductor
FER	Ferroxcube Corp.
FPC	Fiar-Rite Products Corp.
FSP	Federal Screw Products, Inc.
GCE	GC Electronics
GE	General Electric Co.
GEP	Gates Energy Prods. Inc.
GLO	Globe-Union Inc.
GOR	W.L. Gore & Assocs. Corp.
GOU	Gould National Batteries, Inc.
GOW	Gowanda
GRA	Grayhill, Inc.
GRE	Gremar, ITT
GRL	Greenline
GRO	Groov-Pin Corp.
GSC	Gudebrod Bros. Silk Co., Inc.
GUA	Guardian Electric Mfg. Co.
GUD	Gudeman
GVG	Grass Valley Group, Inc.
HAM	Hamlin Inc.
HAR	Harris
HEI	Heinemann
HEY	Heyman Mfg. Co.
HIG	Hi-G Inc.
HOY	Hoyt Elec. Instr. Works
HP	Hewlett-Packard - Paeco
HRL	Hartwell Corp.
HSP	Hardware Specialties
HUB	Harvey Hubbel, Inc.
HUD	Hudson Tool & Die Co.
ICO	ICO/Rally
IEE	Industrial Electronic Engrs.
IMB	IMB Electronic Products Inc.
INR	International Resistor Co.
INT	International Electro Exc.
IRC	International Rectifier
IRR	Industrial Retaining Ring Co.
ISC	Instrument Specialty Co.
IT	Information Terminals Corp.
ITM	Intermec
ITL	Intel Corp.
ITS	Intersil
ITT	International Tel. & Tel.
JBT	J-B-T Instruments, Inc.
JOH	Johanson
JON	E.F. Johnson Co.
KAH	Kahgan
KEM	Kemet, Union Carbide
KEY	Keystone Electronics Corp.
KIN	Kings Electronics Co., Inc.
KLI	Kilixon
KUL	Kulka Electronics Corp.
LAD	La Deau Mfg. Co.
LAM	Lambda Electronics Corp.
LAN	Lansco Die Casting
LED	Ledex
LEE	Leecraft Mfg. Co., Inc.
LFI	Littlefuse, Inc.
LIC	Licon, ITW
LIT	Litronix
LSC	Lee Spring Co.
LYN	Lyn-Tron, Inc.
MAG	Magnecraft Electric Co.
MAL	Mallory & Co., Inc.
MAR	Marco-Oak Industries
MAS	Magnet Sales
MAT	Matthey Printed Products LTD.
McC	McCoy Electronics Co.
McG	McGraw Edison Co.
McM	McMasters Carr
MEC	Mechanical Enterprises Inc.
MIC	Microsonics Div.
MID	Midwec Corp.
MIL	J.W. Miller Co.
MIS	Micro Switch Div.
3M	Minnesota Mining & Mfg.
MN	Marshall Newell
MOM	Monolithic Memories
MON	Monsanto
MOS	Mostek Corp.
MOT	Motorola Semiconductor
MSP	Master Specialties
NAP	North American Phillips
NAT	National Radio Co.
NCC	Nippon Chemi Con
NDI	N-D Industries
NEI	Northern Engineering Labs, Inc.
NEC	Nippon Co. of America
NIC	Nichicon (America) Corp.
NLE	North Lake Eng., Inc.
NSE	National Semiconductor
NWC	National Wire & Cable Corp.
NYT	Nytronics
OAK	Oak Switch
OHM	Ohmite Mfg. Co.
OSH	Oshino Electric Lampworks Ltd.
PAK	Paktron Div.
PAM	Pamotor, Inc.
PAN	Panduit Corp.
PB	Potter & Brumfield
PEM	Pem Engr. & Mfg.
PHN	Phoenix Transformer
POL	Polaroid Corp.
POM	Pomona Electronics Co.
POW	Power Mate

RAY	Raytheon
RCA	RCA Corp.
RCL	RCL Electronics, Inc.
REI	Robison Electronics Inc.
REL	Reliance Universal Inc. Cal
ROB	Robinson Nugent
ROG	Rogan Corp.
ROS	Ross Co., Milton
ROT	Rotron
ROY	Royal Industries, El Segundo
RTS	Ried Tool Supply Co.

SAE	Stanford Applied Engineering
SAN	Sangamo Electric Co.
SAV	Sava Industries Inc., N.J.
SCA	Scanbe Mfg. Corp.
SCF	South Co. Fasteners
SEA	Sealectro Corp.
SEM	Seastom Mfg. Co.
SFE	San Fernando Electric
SIG	Signetics Corp.
SII	Sigma Instruments Inc.
SIL	Siliconix, Inc.
SIM	Simpson Electric Co.
SLF	Sloss Fasteners
SLO	Sloan Co.
SMI	Smith, Inc., Herman
SOR	Sorensen
SPE	Spectrol Electronics
SPR	Sprague Electronic Co.
SPS	Standard Power Supply Co.
SPY	Sperry
SSC	Spectra Strip Corp.
STC	Signal Transformer Co.
STH	Southco Inc.
STI	Sarkes Tarzian Inc.
STM	S.T.M. Corp.
STY	Stanley Tools
SWI	Switchcraft, Inc.
SYK	Sykes Datatronics Inc.
SYL	Sylvania Electric

TDK	TDK Ferrites Co , Ltd.
TEC	TEC Inc.
TEK	Tektronix
THB	Thomas & Betts Co.
THE	Thermalloy Inc.
TIN	Tinnerman
TI	Texas Instruments, Inc.
TPL	Triplett Corp.
TRI	Triad Transformer Corp.
TRO	Trompeter Electronics Inc.
TRW	TRW Inc.
TTE	TT Electronics Inc.

USE	USECO Div.
UTC	TRW/UTC Transformers

VAC	Vactec Inc.
VEC	Vector Electronic Co. Inc.
VER	Vero Electronics, Inc.
VIK	Viking Industries
VRY	Varadyne Industries Inc.

WAK	Wakefield Engineering
WDC	Western Digital Corp.
WEC	Weckesser Co., Inc.
WES	Weston Components & Controls
WHE	Westinghouse Electric
WIN	Winchester Electronics
WIR	The Wire Mold Co.
WLC	Ward Leonard Electric
WMS	Western Mach. Screw Prod.
WTA	Waldes Tru Arc

REPLACEMENT PARTS LIST

CABLE ASSY,RBN SW BD TO CPU 50 CNT
ASSEMBLY NUMBER: 054700-00 ISSUE: A ECN: W448

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999 B06		000000-00	REFERENCE DOCUMENTS	0
002		CA4065-02	CBL,RBN 50 CNDCT 28 AWG GRAY 3M/3365/50	0
001		CF1434-00	CONN,RCPT 50POS 2ROW RBN CBL W/RLF AMP/1-746183-2	2
004		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1

REPLACEMENT PARTS LIST

CABLE ASSY,RBN DSK DRV TO CPU 34CNT
ASSEMBLY NUMBER: 054701-00 ISSUE: C ECN: Z101

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	B06	000000-00	REFERENCE DOCUMENTS	0
002		CA4064-02	CBL,RBN 34 CNDCT 28 AWG GRA 3M/3365-34	0
001		CF1365-00	CONN,RCPT 34POS 2ROW RBN CBL AMP/499498-9	2
004		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1

REPLACEMENT PARTS LIST

CABLE ASSY,RBN DSK DRV TO CPU RK MT
ASSEMBLY NUMBER: 054701-01 ISSUE: C ECN: Z101

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	B06	000000-00	REFERENCE DOCUMENTS	0
002	1 PC. 72 INCHES LONG	CA4064-02	CBL,RBN 34 CNDCT 28 AWG GRA 3M/3365-34	2
001		CF1365-00	CONN,RCPT 34POS 2ROW RBN CBL AMP/499498-9	2
004		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1

<< GVG - PSD >>

REPLACEMENT PARTS LIST

CABLE ASSY,RBN DSK DRV TO CPU 34CNT
ASSEMBLY NUMBER: 054701-10 ISSUE: C ECN: Z101

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
002		CA4064-02	CBL,RBN 34 CNDCT 28 AWG GRA 3M/3365-34	0
001		CF1365-00	CONN,RCPT 34POS 2ROW RBN CBL AMP/499498-9	2
004		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1

REPLACEMENT PARTS LIST

CABLE,POWER DISK DRV TO CPU 4CNT
ASSEMBLY NUMBER: 054702-00 ISSUE: B ECN: Z101

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	B06	000000-00	REFERENCE DOCUMENTS	0
001		CF1247-00	CONN,RCPT 4POS 1ROW TANDEM SPR AMP/87499-7	2
002		CF1273-00	CONN,SKT CNT 24-20 AWG REEL AMP/87309-8	6
005		CF1286-00	CONN,KEY PL NYL NAT AMP/87077-2	2
006		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1
003	CUT 3 @ 3.50"	WB0219-00	WIRE,22 AWG 7X30 WHT 9 BEL/8524 WHITE	1

<< GVG - PSD >>

REPLACEMENT PARTS LIST

CABLE,POWER DSK DRV TO CPU RACK MT
ASSEMBLY NUMBER: 054702-01 ISSUE: B ECN: Z101

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	B06	000000-00	REFERENCE DOCUMENTS	0
001		CF1247-00	CONN,RCPT 4POS 1ROW TANDEM SPR AMP/87499-7	2
002		CF1273-00	CONN,SKT CNT 24-20 AWG REEL AMP/87309-8	6
005		CF1286-00	CONN,KEY PL NYL NAT AMP/87077-2	2
006		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1
003	CUT 3 72.5 INCHS LNG	WB0219-00	WIRE,22 AWG 7X30 WHT 9 BEL/8524 WHITE	18

REPLACEMENT PARTS LIST

CABLE ASSY,PWR DSK DRV TO CPU 4CNT
ASSEMBLY NUMBER: 054702-10 ISSUE: B ECN: Z101

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001		CF1247-00	CONN,RCPT 4POS 1ROW TANDEM SPR AMP/87499-7	2
002		CF1273-00	CONN,SKT CNT 24-20 AWG REEL AMP/87309-8	6
005		CF1286-00	CONN,KEY PL NYL NAT AMP/87077-2	2
006		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1
003	CUT 3 @ 5.0 INCHES	WB0219-00	WIRE,22 AWG 7X30 WHT 9 BEL/8524 WHITE	1

<< GVG - PSD >>

REPLACEMENT PARTS LIST

CABLE ASSY,RBN LVRARM TO SW BD 3CNT
ASSEMBLY NUMBER: 054703-00 ISSUE: A ECN: Z389

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	B06	000000-00	REFERENCE DOCUMENTS	0
001		CF1247-00	CONN,RCPT 4POS 1ROW TANDEM SPR AMP/87499-7	2
002		CF1273-00	CONN,SKT CNT 24-20 AWG REEL AMP/87309-8	6
005		CF1286-00	CONN,KEY PL NYL NAT AMP/87077-2	2
003	CUT 3 EA @ 4"	WB0038-00	WIRE,24 AWG 7X32 WHT 9 BEL/B24(7) WHITE	1

REPLACEMENT PARTS LIST

CABLE ASSY,RBN EMEM TO SW BD 26CNT
ASSEMBLY NUMBER: 054704-00 ISSUE: A ECN: W448

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999 B06		000000-00	REFERENCE DOCUMENTS	0
002		CA4043-00	CBL,RBN 26 CNDCT 28 AWG GRA 3M/3365/26	0
001		CF0382-00	CONN,RCPT 26POS 2ROW RBN CBL W/RLF 3M/3399-6026	2
004		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1

REPLACEMENT PARTS LIST

CABLE ASSY,PWR DSPLY TO SW BD 12CNT
ASSEMBLY NUMBER: 054705-00 ISSUE: A ECN: W448

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	B06	000000-00	REFERENCE DOCUMENTS	0
003		CF0890-00	CONN,CNT 22-30 AWG MOL/08-50-0032	24
001		CF1128-00	CONN,RCPT 12POS 1ROW FREE HNG MOL/22-01-1123	2
004		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1
002	12 EA @ 3.5"	WB0219-00	WIRE,22 AWG 7X30 WHT 9 BEL/8524 WHITE	4

REPLACEMENT PARTS LIST

CABLE ASSY,PWR SUP HARNESS,4RU
ASSEMBLY NUMBER: 054708-10 ISSUE: A ECN: Z311

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D06/11-074707-10	000000-00	REFERENCE DOCUMENTS	0
003	23 EA CF1431-00	CF0106-00	CONN,SKT CNT 18-16 AWG AMP/66101-4	23
002	J1	CF1431-00	CONN,PL 24POS PNL MTG AMP/207304-1	1
032	J2	CF1773-00	CONN,RCPT 2POS 1ROW FREE HNG AMP/172343-1	1
029	2 EACH CF1773-00 8 EACH CF1792-00 3 EACH CF1782-00	CF1775-00	CONN,SKT CNT 18-22 AWG AMP/170366-1	13
031	5 EACH CF1781-00 8 EACH CF1791-00	CF1776-00	CONN,PIN CNT 18-22 AWG AMP/170364-1	13
030	J4	CF1781-00	CONN,PL 6POS 2ROW PNL MNT AMP/172339-1	1
028	J4	CF1782-00	CONN,RCPT 6POS 2ROW PNL MNT AMP/172331-1	1
035	J3 1 EACH CF1792-00	CF1791-00	CONN,PL 9POS 3ROW PNL MNT AMP/172340-1	1
037	J3	CF1792-00	CONN,RCPT 9POS 3ROW PNL MNT AMP/172332-1	1
039	TO PROTECT WIRES ROUTED BEHIND THE POWER SUPPLY	HA9006-00	HEAT SHRNK TBG,.5 CLR GVG/A70-HA9006-00 A1	1
020	TP P/S 5V,GND	TA6082-00	TERM,#10 SCRW &10-12 WIRE INSUL YEL PAN/PV10-10R	4
023	2 EACH WB0301-00 2 EACH WB0306-00 (FOR ON/OFF SWITCH SJ0241-00) 1 EACH WB0319-00	TA6148-00	TERM,RCPT FASTON INSUL 22-18AWG .25 AMP/2-520184-2	5
021	TO P/S SENSE LINES	TA6214-00	TERM,RCPT 22-18 AWG TIN PLT AMP/61260-1	2
024	(FOR CORCORM) 1 EACH WB0304-00 1 EACH WB0306-00 1 EACH WB0301-00 1 EACH WB0307-00	TA6217-00	TERM,FASTON 18-22 AWG INSUL AMP/2-520084-2	4
025	(TO STUD GND J5) 1 EACH WB0319-00 1 EACH WB0335-00	TA6219-00	TERM,RING 16-22AWG #6X.25 RED INSUL AMP/51863	2
022	1 EACH WB0307-00 1 EACH WB0303-00 2 EACH WB0315-00	TA6220-00	TERM,FASTON INSUL 14-16AWG .187X.02 AMP/3-350816-2	4
026	3 EACH WB0302-00 1 EACH WB0306-00 1 EACH WB0301-00 1 EACH WB0319-00 2 EACH WB0304-00	TA6222-00	TERM,FASTON 18-22 AWG AMP/2-520182-2	9
016	AC HOT LINE	WB0301-00	WIRE,18 AWG 19X32 BRN 1	3

REPLACEMENT PARTS LIST

CABLE ASSY,PWR SUP HARNESS,4RU
ASSEMBLY NUMBER: 054708-10 ISSUE: A ECN: Z311

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			ANI/UL1430 18AWG 19/30 BROWN	
009	+24	WB0302-00	WIRE,18 AWG 19X32 RED 2 ANI/UL1430 18AWG 19/30 RED	4
014	+12 TO FAN	WB0303-00	WIRE,18 AWG 19X32 ORN 3 ANI/UL1430 18AWG 19/30 ORANGE	2
010	-12,11/220 SELECT	WB0304-00	WIRE,18 AWG 19X32 YEL 4 ANI/UL1430 18AWG 19/30 YELLOW	5
013	NEUTRAL,S+	WB0306-00	WIRE,18 AWG 19X32 BLU 6 ANI/UL1430 18AWG 19/30 BLUE	4
038	110/220 SELECT	WB0307-00	WIRE,18 AWG 19X32 VIO 7 ANI/UL1430 18AWG 19/30 VIOLET	1
012	FAN GND,S-,AUX GNDS	WB0315-00	WIRE,18 AWG 19X30 WHT/GRN 95 ANI/UL1430 18AWG 19/30 WHT/GRN	4
018	21 INCH A GND TO CF1781-00, 1 FT TO 1 TA6219-00	WB0319-00	WIRE,18 AWG 19X30 GRN/YEL 54 VDE GLT/H05V-K/18	3
008	+12 TO CF1431-00	WB0333-00	WIRE,16 AWG 19X29 ORN 3 ANI/UL1430 16AWG 19/29 ORANGE	1
005	GND TO CF1431-00, .5 FT TO 1 TA6219-00	WB0335-00	WIRE,16 AWG 19X29 GRN 5 ANI/UL1430 16AWG 19/29 GREEN	5
006	+5 TO CF1431-00	WB0336-00	WIRE,16 AWG 19X29 BLU 6 ANI/UL1430 16AWG 19/29 BLUE	4
007	-5.2 TO CF1431-00	WB0337-00	WIRE,16 AWG 19X29 VIO 7 ANI/UL1430 16AWG 19/29 VIOLET	1

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                        << G V G - P S D >>                PAGE  1

                 R E P L A C E M E N T   P A R T S   L I S T

  CABLE ASSY,PWR SW BD TO CPU 6CNT
 ASSEMBLY NUMBER: 054709-00          ISSUE: A                 ECN: W448

ITM    REFERENCE          GVG         DESCRIPTION                         QTY
NO     DESIGNATOR        PART NUMBER    MFG CODE/PART NUMBER

999 B06                  000000-00   REFERENCE DOCUMENTS                   0

005                      CF0106-01   CONN,SKT CNT 18-16 AWG REEL          12
                                        AMP/66100-9
002                      CF0625-00   CONN,PL 6POS 1ROW FREE HANG           2
                                        AMP/207377-1
009                      LA1050-00   LABEL,WHITE STKY-BACK .75 X 1.00      1
                                        BRA/DAT-37-292-1
006 CUT 6 EA @ 3.5"      WB0309-00    WIRE,18 AWG 19X32 WHT 9              2
                                        ANI/UL1430 18AWG 19/30 WHITE

        END OF REPORT

        END OF REPLACEMENT PARTS LIST   06-Jul-91   11:56 AM


                 ENTER DESIRED SELECTION: brpm
BRPM Password?


        REPLACEMENT PARTS LIST   06-Jul-91   12:10 PM

ASSEMBLY PART NUMBER? 054700-00
ASSEMBLY QUANTITY (1 = return)?
ASSEMBLY PART NUMBER?
EFFECTIVITY DATE (ALL = return)?
SEQUENCE BY ITEM NO. (1) OR COMPONENT PART NO. (2)? 2
OUTPUT TO TERMINAL (Y, a file name, or N=return)? y
ENTER <return> TO START
```

<< GVG - PSD >>

REPLACEMENT PARTS LIST

CABLE ASSY,DPM100 FRM TO CNTL PNL
ASSEMBLY NUMBER: 054717-00 ISSUE: A ECN: Z312

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	C06	000000-00	REFERENCE DOCUMENTS	0
001	CUT TO CUSTOM LENGTH	CA4170-00	CBL,9 CNDCT SHD 24 AWG D/W NAT/S10-9272 REV.A	100
002		CF0792-00	CONN,CBL SHIELD ASSY 15POS #2 SHELL AMP/745172-1	6
003		CF1135-00	CONN,RCPT 15POS W/SLDR CUPS AMP/747909-2	3
004		CF1136-00	CONN,PL 15POS W/SLDR CUPS AMP/747908-2	3
016		HA1098-00	HDW,SPLIT-RING FERRULE .370 DIA AMP/745508-6	6
011		HA9005-00	HEAT SHRNK TBG,.375 CLR GVG/A70-HA9005-00 A1	2
015		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	6

REPLACEMENT PARTS LIST

CABLE ASSY,DPM100 FRM TO CNTL PNL
ASSEMBLY NUMBER: 054717-10 ISSUE: A ECN: Z312

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999 C06		000000-00	REFERENCE DOCUMENTS	0
001		CA4170-00	CBL,9 CNDCT SHD 24 AWG D/W NAT/S10-9272 REV.A	10
005		CF0098-00	CONN,PIN CNT 24-20 AWG 20DF REEL AMP/66506-4	8
006		CF0100-00	CONN,SKT CNT 24-20 AWG 20DF REEL AMP/66504-4	8
002		CF0792-00	CONN,CBL SHIELD ASSY 15POS #2 SHELL AMP/745172-1	2
004		CF1133-00	CONN,PL 15POS 2ROW PNL MNT AMP/205206-3	1
003		CF1134-00	CONN,RCPT 15POS 2ROW PNL MNT AMP/205205-2	1
008		CF1397-01	CONN,SKT CNT 22-18 AWG 20DF STP AMP/745230-5	6
007		CF1398-01	CONN,PIN CNT 22-18 AWG 20DF STP AMP/745229-5	6
016		HA1098-00	HDW,SPLIT-RING FERRULE .370 DIA AMP/745508-6	2
011		HA9005-00	HEAT SHRNK TBG,.375 CLR GVG/A70-HA9005-00 A1	0
015		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1

REPLACEMENT PARTS LIST

CABLE ASSY,DPM100 FRM TO CNTL PNL
ASSEMBLY NUMBER: 054717-30 ISSUE: A ECN: Z312

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999 C06		000000-00	REFERENCE DOCUMENTS	0
001		CA4170-00	CBL,9 CNDCT SHD 24 AWG D/W NAT/S10-9272 REV.A	30
005		CF0098-00	CONN,PIN CNT 24-20 AWG 20DF REEL AMP/66506-4	8
006		CF0100-00	CONN,SKT CNT 24-20 AWG 20DF REEL AMP/66504-4	8
002		CF0792-00	CONN,CBL SHIELD ASSY 15POS #2 SHELL AMP/745172-1	2
004		CF1133-00	CONN,PL 15POS 2ROW PNL MNT AMP/205206-3	1
003		CF1134-00	CONN,RCPT 15POS 2ROW PNL MNT AMP/205205-2	1
008		CF1397-01	CONN,SKT CNT 22-18 AWG 20DF STP AMP/745230-5	6
007		CF1398-01	CONN,PIN CNT 22-18 AWG 20DF STP AMP/745229-5	6
016		HA1098-00	HDW,SPLIT-RING FERRULE .370 DIA AMP/745508-6	2
011		HA9005-00	HEAT SHRNK TBG,.375 CLR GVG/A70-HA9005-00 A1	0
015		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1

<< GVG - PSD >>

REPLACEMENT PARTS LIST

CABLE ASSY,DPM100 FRM TO CNTL PNL
ASSEMBLY NUMBER: 054717-99 ISSUE: A ECN: Z312

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999 C06		000000-00	REFERENCE DOCUMENTS	0
001		CA4170-00	CBL,9 CNDCT SHD 24 AWG D/W NAT/S10-9272 REV.A	100
005		CF0098-00	CONN,PIN CNT 24-20 AWG 20DF REEL AMP/66506-4	8
006		CF0100-00	CONN,SKT CNT 24-20 AWG 20DF REEL AMP/66504-4	8
002		CF0792-00	CONN,CBL SHIELD ASSY 15POS #2 SHELL AMP/745172-1	2
004		CF1133-00	CONN,PL 15POS 2ROW PNL MNT AMP/205206-3	1
003		CF1134-00	CONN,RCPT 15POS 2ROW PNL MNT AMP/205205-2	1
008		CF1397-01	CONN,SKT CNT 22-18 AWG 20DF STP AMP/745230-5	6
007		CF1398-01	CONN,PIN CNT 22-18 AWG 20DF STP AMP/745229-5	6
016		HA1098-00	HDW,SPLIT-RING FERRULE .370 DIA AMP/745508-6	2
011		HA9005-00	HEAT SHRNK TBG,.375 CLR GVG/A70-HA9005-00 A1	0
015		LA1050-00	LABEL,WHITE STKY-BACK .75 X 1.00 BRA/DAT-37-292-1	1

REPLACEMENT PARTS LIST

BRD,FRAME CONTROL PROCESSOR
ASSEMBLY NUMBER: 064700-03 ISSUE: B ECN: Z440

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D45,D10,D00,D07/08 MOD INSTRUCTIONS: 04-1	000000-00	REFERENCE DOCUMENTS	0
101		024700-00	BAR,MODULE SUPPORT	1
102		024701-00	STIFFENER,PC BOARD FRONT DPM-100	1
001	X1 FAB	044700-04	PCB,FRAME CONTROL PROCESSOR MODULE	1
002	FB1,FB2,FB7,	054721-00	FLTR,EMI,FERRITE BEAD PSC/PSC-5047	3
003	B1	BA2007-00	BTRY,RECHRG 3.6V .110AMPHR NICAD GVG/A70-BA2007-00 A2	1
006	C211, MOD:04-1	CB0106-00	CAP,CER 1000PF 10% 50WV X7R AVX/SR155C102KAA	2
143	C1,C2,C108,C114, C139,C154,C225,C240,	CB0112-00	CAP,CER .01UF 10% 50WV X7R AVX/SR155C103KAA	8
004	C3,C5,C6,C7,C8,C9, C12,C13,C14,C16,C17, C18,C19,C20,C21,C22, C23,C24,C25,C26,C27, C28,C29,C30,C31,C32, C33,C34,C35,C36,C38, C39,C41,C43,C44,C45, C46,C48,C50,C51,C52, C53,C54,C55,C56,C58, C59,C60,C61,C62,C64, C67,C68,C69,C71,C72, C73,C74,C75,C76,C78, C79,C80,C82,C83,C84, C85,C86,C87,C88,C89, C90,C91,C93,C94,C95, C97,C99,C100,C101, C102,C103,C104,C105, C107,C109,C110,C111, C113,C115,C116,C117, C118,C119,C120,C121, C122,C124,C125,C126, C130,C131,C132,C133, C136,C138,C140,C141, C142,C143,C144,C145, C146,C147,C148,C149, C150,C151,C152,C153, C158,C160,C161,C162, C163,C164,C165,C167, C168,C169,C170,C172, C177,C178,C179,C188, C189,C190,C192,C193, C195,C196,C197,C198, C199,C200,C201,C202,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	169

REPLACEMENT PARTS LIST

BRD,FRAME CONTROL PROCESSOR
ASSEMBLY NUMBER: 064700-03 ISSUE: B ECN: Z440

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
004	C203,C204,C205,C206, C207,C208,C209,C210, C212,C214,C215,C216, C217,C218,C219,C220, C221,C222,C223,C224, C226,	CB0268-00	CONTINUED FROM PREVIOUS PAGE MUR/SL105E103MAA	
005	C4,C10,C15,C37,C42, C47,C63,C66,C70,C77, C81,C92,C96,C98, C106,C112,C123,C127, C134,C135,C137,C166, C171,C173,C174,C175, C176,C184,C185,C186, C187,C191,C194,C213, C227,C229,C230,C231, C234,C236,	CB0354-00	CAP,CER .1UF 20% 50WV Z5U AXIAL MUR/RPA10Z5U104M50PT	40
007	C237,C238,C239,	CB1095-00	CAP,ALUM 330UF 20% 50WV GVG/A70-CB1095-00 A1	3
124	TACK-ON	CB2210-00	CAP,MICA D10 22PF 5% 500WV COD/CD10ED220J03	1
008	C11	CB2212-00	CAP,MICA D10 27PF 5% 500WV COD/CD10ED270J03	1
009	C49	CB2214-00	CAP,MICA D10 33PF 5% 500WV COD/CD10ED330J03	1
010	C128,C129,	CB2218-01	CAP,MICA D10 47PF 2% 500WV COD/CD10ED470G03	2
011	C155,C156,C157,C159, C232,C233,	CB4019-00	CAP,TANT 6.8UF 10% 15WV GVG/A70-CB4019-00 A2	6
012	C40,C57,C65,C180, C181,C182,C183,C228, C235,	CB4022-00	CAP,TANT 22UF 10% 15WV GVG/A70-CB4022-00 A1	9
013	EJ3,EJ4,	CC2073-00	CARD EJCTR,NYL BLK .062 THK PCB CAK/107-20	2
014	J4	CF0676-03	CONN,PL HDR 3POS 1ROW PCB MNT 3M/929647-01-03-30	1
015	J1,J3	CF1039-00	CONN,PL 96POS 3ROW RTANG PAN ONLY GVG/A70-CF1039-00 A1	2
016	J7	CF1161-00	CONN,PL HDR 10POS 2ROW PCB MNT AMP/102973-5	1
017	J5,J6	CF1206-00	CONN,PL HDR 20POS 2ROW PCB MNT AMP/1-87227-0	2
018	J9,J15,	CF1342-00	CONN,PL HDR 36POS 2ROW PCB MNT AMP/1-102973-8	2
019	J11,J12,	CF1720-00	CONN,PL HDR 56POS 2ROW VERT PCB MNT AMP/2-103186-8	2
105	J8,J10,J13,	CF1819-00	CONN,PL HDR 56POS 2ROW VERT PCB MNT AMP/2-102973-8	3
108	J14	CF1834-00	CONN,PL HDR 36POS 2ROW VERT PCB MNT AMP/1-103186-8	1
104	J2 KEYED	CF1883-00	CONN,PL 96POS 3ROW RTANG PCB 5KEYED	1

REPLACEMENT PARTS LIST

BRD,FRAME CONTROL PROCESSOR
ASSEMBLY NUMBER: 064700-03 ISSUE: B ECN: Z440

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			PAN/100-096-2007	
020	Y4,	CJ2043-00	CRYSTAL,3.6864MHZ HC-18U GVG/A70-CJ2043-00 A2	1
021	Y3,	CJ2047-00	CRYSTAL,10MHZ 14 DIP CTK/MXO-55 GA-2C 10.000MHZ	1
022	Y1,Y2,	CJ2065-00	CRYSTAL,33.3333MHZ OSC 14 DIP CTK/MXO-55 GA-1C 33.333MHZ	2
106	J7 (2 EA) J4	JA1009-00	JACK,SHTG BLK PLSTC 2 CNT AMP/530153-2	3
023	K9,	RA7031-01	RLY,DPDT 5V 125 OHM UL/CSA 2 FORM C ARO/DS-2E-S-DC5V	1
024	K1,K2,K3,K4, K5,K6,K7,K8,	RA7037-00	RLY,REED SPST 5V 500OHM W/DIODE SIP CPC/DSS41A05B	8
025	R35	RB2000-00	RES,0 OHM 5% 1/4W MTL FLM GVG/A70-RB2000-00 A3	1
026	R7,R8,R9,R10,R11, R12,R13,R14,R15,R22, R23,R24,R25,R26,R27, R28,R29,R30,R31,R32, R47,R49,R57,R69,R84, R93,R97,	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	27
027	R62,R70,	RB2102-00	RES,1K OHM 2% 1/4W MTL FLM GVG/A70-RB2102-00 A1	2
028	R44,R45,R72,R74, R91,R92,	RB2103-00	RES,10K OHM 2% 1/4W MTL FLM GVG/A70-RB2103-00 A1	6
029	R55,	RB2104-00	RES,100K OHM 2% 1/4W MTL FLM GVG/A70-RB2104-00 A1	1
030	R39,R40,	RB2105-00	RES,1 MEG OHM 2% 1/4W MTL FLM GVG/A70-RB2105-00 A1	2
032	R1,R2,R3,R4,R5,R6, R16,R17,R18,R19,R20, R21,	RB2181-00	RES,180 OHM 2% 1/4W MTL FLM GVG/A70-RB2181-00 A1	12
033	R33,R50,R52,R58,R59, R63,R64,R71,R75,R77, R80,	RB2222-00	RES,2.2K OHM 2% 1/4W MTL FLM GVG/A70-RB2222-00 A1	11
034	R41,	RB2331-00	RES,330 OHM 2% 1/4W MTL FLM GVG/A70-RB2331-00 A1	1
035	R54,R56,R65,R66,R67, R68,R76,R78,R81,R82, R83,R85,R87,R94,R95,	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	15
036	R36,R37,R53,R90	RB2471-00	RES,470 OHM 2% 1/4W MTL FLM GVG/A70-RB2471-00 A1	4
037	R43	RB2472-00	RES,4.7K OHM 2% 1/4W MTL FLM GVG/A70-RB2472-00 A1	1
038	R51,R60,R61,R73,R79, MOD: 04-1	RB2560-00	RES,56 OHM 2% 1/4W MTL FLM GVG/A70-RB2560-00 A1	6
039	R38,R42,R46,R48,R88, R89,	RB2681-00	RES,680 OHM 2% 1/4W MTL FLM GVG/A70-RB2681-00 A1	6
040	RN1,RN2,RN3,RN4,RN5, RN6,RN7,RN8,RN9,RN10	RN0044-00	RES NTWK,4.7K OHM 9 RES 10 SIP AB/710A472	34

REPLACEMENT PARTS LIST

BRD,FRAME CONTROL PROCESSOR
ASSEMBLY NUMBER: 064700-03 ISSUE: B ECN: Z440

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
040	RN11,RN12,RN13,RN14, RN15,RN16,RN17,RN18, RN19,RN20,RN21,RN22, RN23,RN24,RN25,RN26, RN35,RN37,RN39,RN40, RN41,RN42,RN43,RN44,	RN0044-00	CONTINUED FROM PREVIOUS PAGE AB/710A472	
041	RN27,RN31,	RN0074-00	RES NTWK,10K OHM 8 RES 16 DIP AB/316B103	2
042	RN28,RN29,RN30,RN32, RN33,RN34,RN36,RN38,	RN0077-00	RES NTWK,22 OHM 8 RES 16 DIP BEK/898-3-R22	8
043	R86	RV7509-00	RES,75 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 75 OHM 1%	1
107	4 EA 024700-00	SA1401-01	SCRW,MACH 2-56X.625 PH PNHD W/NYL FFT/MACH 2-56X.625 PH PNHD SST W/NL	4
044	DS1,DS2,DS3,DS4,DS5, DS6,DS7,DS8,DS9,DS10 DS11,DS12,DS13,DS14, DS15,DS16,DS17,DS18, DS19,DS20,DS21,DS22, DS23,DS24,DS25,DS26, DS27,DS28,DS29,	SB1018-00	DIODE,LED MV5453 GRN WIDE-BEAM GI/MV5453	29
045	D1,D2,D3,	SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	3
046	Q2,	SB6018-00	TRANS,FET SD215 TO-72-33 CLG/SD215DEG	1
047	Q1	SB8004-00	TRANS,PNP 2N4126 TO-92 SM-SIG GVG/A70-SB8004-00 A2	1
048	U0716,	SC0035-00	IC,TTL 7417 14 DIP 7417	1
056	U1425,	SC0955-00	IC,MEM X2864AP-25 28 DIP 250NSEC AMD/AM2864AE-255DC	1
049	U0907 054196-01 U0908 054197-02 U0912 054198-02	SC0966-00	IC,MEM CY7C291A-35PC 24 DIP CYP/CY7C291A-35PC	3
050	U1415,	SC0977-00	IC,TTL MAX232CPE 16 DIP GVG/A70-SC0977-00 A1	1
051	U1409 054152-00 U1510 054149-00	SC1018-00	IC,MEM CY7C225-30PC 24 DIP AMD/AM27S25APC	2
052	U1216,U1315,U1316, U1515,U1517,U1915,	SC1019-00	IC,LIN DS8921N 8 DIP GVG/A70-SC1019-00 A1	6
055	U1205,U1411,U1513, U1705,	SC1149-00	IC,MEM IDT7216L-55J 68 PLCC AMD/AM29C516AJC	4
089	U0423 054185-01 U0909 054195-02 U0914 054186-01 U1109 054194-01 U1621 054249-01	SC1246-00	IC,PAL GAL16V8A-25PL 20 DIP AMD/PALCE16V8H-25PC/4	5
109	U0323 054184-02 U0322 054183-02 U1121 054182-03	SC1246-01	IC,PAL GAL16V8A-10LP 20 DIP LAT/GAL16V8A-10LP	4

REPLACEMENT PARTS LIST

BRD,FRAME CONTROL PROCESSOR
ASSEMBLY NUMBER: 064700-03 ISSUE: B ECN: Z440

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
109	U1122 054182-03	SC1246-01	CONTINUED FROM PREVIOUS PAGE LAT/GAL16V8A-10LP	
100	U0119,U0121,U0122, U0124,U0125,U0126, U0219,U0221,U0222, U0224,U0225,U0226, U1222,U1224,U1225, U1226,U0522,U0524, U0525,U0526,U0622, U0624,U0625,U0626, U0722,U0724,U0725, U0726,U0922,U0924, U0925,U0926,	SC1280-00	IC,MEM CDM62256E10 28 DIP GVG/A70-SC1280-00 A3	32
057	U1821,	SC1360-00	IC,HCMOS 74HC259N 16 DIP MOT/MC74HC259N	1
066	U0326,U0327,U0426, U0427,U0821,U0920, U1125,U1126,U1422, U1819,U1820,	SC1436-00	IC,ACMOS 74AC245PC 20 DIP GVG/A70-SC1436-00 A2	11
059	U0218,U1016,U1218, U1317,U1417,U1815,	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	6
060	U1318,	SC1453-00	IC,ACMOS 74ACT74 14 DIP GVG/A70-SC1453-00 A2	1
061	U0321,	SC1456-00	IC,ACMOS 74ACT161 16 DIP GVG/A70-SC1456-00 A2	1
080	U0820,U0921,U1619, U1620,U1816,U1817,	SC1461-00	IC,ACMOS 74AC573 20 DIP GVG/A70-SC1461-00 A2	6
062	U1902,U1903,U1904, U1905,U1906,U1907,	SC1462-00	IC,ACMOS 74AC574 20 DIP GVG/A70-SC1462-00 A2	6
063	U0902,U1407,U1505, U1507,	SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC NSC/SCX6244UEC/V2	4
065	U0118 054190-02 U1424 054189-02 U1426 054191-02	SC1636-00	IC,MEM AM27C512-175DC 28 DIP AMD/AM27C512-175DC	3
067	U1602,U1603,	SC1643-00	IC,ACMOS 74ACT283PC 16 DIP HAR/CD74ACT283E	2
068	U1107,U1208,	SC1644-00	IC,ACMOS 74ACT377PC 20 DIP NSC/74ACT377PC	2
069	U1105,U1111,	SC1679-00	IC,ASIC DGTL MIXER/ACCUM 84 PLCC LSI/L1A5047	2
070	U0621 054180-04 U1120 054179-03	SC1683-00	IC,MEM XC1736 8 DIP GVG/A70-SC1683-00 A2	2
071	U1923,	SC1686-00	IC,CMOS MAX172BCNG 24 DIP GVG/A70-SC1686-00 A1	1
072	U0818,	SC1687-00	IC,UP MC68010FN10 68 PLCC GVG/A70-SC1687-00 A1	1
073	U1220,U1320,U1420,	SC1688-00	IC,UP MC68681FN 44 PLCC GVG/A70-SC1688-00 A1	3
074	U0618,	SC1690-00	IC,PAL XC2064-70PC68C 68 PLCC GVG/A70-SC1690-00 A4	1

REPLACEMENT PARTS LIST

BRD,FRAME CONTROL PROCESSOR
ASSEMBLY NUMBER: 064700-03 ISSUE: B ECN: Z440

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
075	U0816,	SC1691-00	IC,ACMOS 74AC10 14 DIP NSC/74AC10PC	1
076	U0420,U0422,U1215, U1221,	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	4
077	U0320,U1418,	SC1712-00	IC,ACMOS 74ACT00 14 DIP GVG/A70-SC1712-00 A2	2
078	U0117,U0904,U0905, U0906,U0910,U0911, U1101,U1102,U1108, U1127,U1206,U1209, U1502,U1616,U1709, U1710,U1711,U1712,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	18
081	U1014,U1212,U1214, U1401,U1414,	SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	5
083	U1511	SC1730-00	IC,ACMOS 74ACT823 24 DIP GVG/A70-SC1730-00 A2	1
084	U0521,	SC1732-00	IC,UP MAX693 16 DIP GVG/A70-SC1732-00 A1	1
085	U1715,	SC1733-00	IC,I/F DP8310N 20 DIP GVG/A70-SC1733-00 A1	1
086	U0718,	SC1735-00	IC,UP MC68440FN10 68 PLCC GVG/A70-SC1735-00 A1	1
087	U1702,U1703,	SC1804-00	IC,ACMOS 74ACT399 16 DIP GVG/A70-SC1804-00 A1	2
079	U1402 054145-00 U1509 054148-01	SC1822-00	IC,PAL 20V8 24 DIP 25NS AMD/PALCE20V8H-25	2
088	U1201 054199-00 U1202 054203-00 U1211 054151-00 U1213 054150-00 U1618 054187-00 U1707 054144-00	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	6
133	U0421 054181-05	SC1824-01	IC,PAL GAL22V10-15L 24 DIP LAT/GAL22V10-15L	1
090	U1722,U1725,	SC1825-00	IC,MEM P28F010-200P1C4 32 DIP GVG/A70-SC1825-00 A2	2
098	U1724,U1726,	SC1826-00	IC,MEM P28F512-200 32 DIP GVG/A70-SC1826-00 A1	2
091	U1018,	SC1872-00	IC,EPLD XC2018-70PC68C 68 PLCC XIL/XC2018-70PC68C	1
092	U0324,U0325,U0424, U0425,U0720,U0721, U1123,U1124, U1421,U1617,U1708, U1818,	SC1991-00	IC,ACMOS 74AC541 20 DIP HAR/CD74AC541E	12
082	U1914	SC1994-00	IC,ACMOS 74AC174 16 DIP NSC/74AC174PC	1
131	U0417,	SC2091-00	IC,UP MC68EC030RP40 124 PGA MOT/MC68EC030RP40	1
130	U1207,	SC2142-00	IC,ACMOS 74ACQ244 20 DIP	1

REPLACEMENT PARTS LIST

BRD,FRAME CONTROL PROCESSOR
ASSEMBLY NUMBER: 064700-03 ISSUE: B ECN: Z440

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			NSC/74ACQ244PC	
058	U0317,	SC2200-00	IC,UP MC68882RC33A 68 PGA MOT/MC68882RC33A	1
093	U1405,	SC7001-00	IC,ASIC S38BC017PM01 52 PLCC MOT/S38BC017PM01	1
110	U0218,U0320,U0716, U0816,U1016,U1218, U1317,U1318,U1417, U1418,U1815,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	11
111	U0321,U0420,U0422, U0521,U1215,U1221, U1415,U1602,U1603, U1702,U1703,U1821, U1914,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	13
112	U0612,U1120,U1216, U1315,U1316,U1515, U1517,U1915,	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	8
113	U0117,U0322,U0323, U0324,U0325,U0326, U0327,U0423, U0424,U0425,U0426, U0427,U0720,U0721, U0820,U0821,U0904, U0905,U0906,U0909, U0910,U0911,U0914, U0920,U0921,U1101, U1102,U1107,U1108, U1109,U1121,U1122, U1123,U1124,U1125, U1126,U1127,U1206, U1207,U1208,U1209, U1421,U1422,U1502, U1616,U1617,U1619, U1620,U1621,U1708, U1709,U1710,U1711, U1712,U1715,U1816, U1817,U1818,U1819, U1820,U1902,U1903, U1904,U1905,U1906, U1907,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	66
114	U0118,U0119,U0121, U0122,U0124,U0125, U0126,U0219,U0221, U0222,U0224,U0225, U0226,U0522,U0524, U0525,U0526,U0622, U0624,U0625,U0626, U0722,U0724,U0725, U0726,U0922,U0924, U0925,U0926,U1222,	SE8035-05	SKT,IC 28 DIP.6 CB BLK STR LEG AMP/2-640362-3	36

REPLACEMENT PARTS LIST

BRD,FRAME CONTROL PROCESSOR
ASSEMBLY NUMBER: 064700-03 ISSUE: B ECN: Z440

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
114	U1224,U1225,U1226, U1424,U1425,U1426,	SE8035-05	CONTINUED FROM PREVIOUS PAGE AMP/2-640362-3	
115	U0421,U0907,U0908, U1912,U1014,U1201, U1202,U1211,U1212, U1213,U1214,U1401, U1402,U1409,U1414, U1509,U1510,U1511, U1618,U1707,U1923,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	21
116	U0902,U1220,U1320, U1407,U1420,U1505, U1507,	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK AMP/3-821688-1	7
117	U0317	SE8052-00	SKT,IC 68 PGA 10X10 LIF AMP/55270-3	1
128	ECO# Z333 U0618,U0718,U0818, U1018,U1205,U1211, U1411,U1705,	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK AMP/3-821689-3	8
118	U0618,U0718,U0818, U1018,U1205,U1411, U1513,U1705,	SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY BUR/QILE68P-410T	8
120	U1722,U1724,U1725, U1726,	SE8074-00	SKT,IC 32 DIP .6 CB BLK AMP/2-644018-3	4
121	U1405	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	1
142	ECO# Z333 U1105,U1111,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	2
122	U1105,U1111	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	2
132	U0417	SE8200-00	SKT,IC 124 PGA 13X13 .140 SLDR TAIL AMP/1-916223-5	1
094	S1	SJ0074-00	SW,PB SPDT MOM PCB MTG CKC/8121-S-D9-A-G-E	1
095	TP1,TP2,TP3,TP4, TP5,TP6,TP7,TP8, TP9,TP10,TP11,TP12, TP13,TP14,TP15,TP16, TP17,TP18,TP19,TP20, TP21,TP22,TP23,TP24, TP25,TP26,TP27,TP28, TP29,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	29
096	FB8,FB9,FB10,FB11,	ZB4131-00	INDCTR,FERRITE BEAD 131 OHM@100MHZ FPC/2643021801	4

REPLACEMENT PARTS LIST

BRD,MULTISTD NTSC INTERFACE
ASSEMBLY NUMBER: 064702-03 ISSUE: D ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D45,D07/08 MOD INSTRUCTIONS 01-1 01-2 (R2) 01-3	000000-00	REFERENCE DOCUMENTS	0
260		024700-00	BAR,MODULE SUPPORT	1
261		024701-00	STIFFENER,PC BOARD FRONT DPM-100	1
204		044702-01	PCB,NTSC INTERFACE	1
205	5 EA 2" LENGTH F1,F2,F3,F4,F10 1 EA 3" LENGTH F7 2 EA 5" LENGTH F11,F12 1 EA 10.5" LENGTH F8	BC7001-00	BUS STP,24.0L 1 SP 24 PIN BEI/B13903-0T	35
010	C94	CB0118-00	CAP,CER .1UF 10% 50WV X7R .2SP AVX/SR215C104KAA	1
031	C802	CB0119-00	CAP,CER .22UF 10% 50WV X7R AVX/SR305C224KAA	1
007	C78,C98,C140,C406, C417,C442,C459,C460, C461,C508,C550,C556, C557,C562,C565,C601, C606,C607,C608,C650, C655,C656,C657,C658, C659,C693,C439,C816, C819,C820,C821,	CB0142-00	CAP,CER .01UF 10% 100WV X7R .2 SP AVX/SR211C103KAA	31
006	C429,C430,C505	CB0281-00	CAP,CER 2200PF 10% 50WV X7R KEM/C317C222K5R5CA	3
025	C822,C825,C826,C827	CB0283-00	CAP,CER 1000PF 10% 50WV X7R KEM/C317C102K5R5CA	4
008	C186,C236,C402,C408, C423,C431,C432,C507,	CB0285-00	CAP,CER .047UF 10% 50WV X7R KEM/C322C473K5R5CA	8
009	C434,C438,C783,C785,	CB0286-00	CAP,CER .022UF 10% 50WV X7R KEM/C322C223K5R5CA	4
011	C3,C4,C5,C6,C17,C18 C22,C23,C24,C33,C35 C42,C52,C53,C54,C65 C66,C67,C68,C70,C75 C76,C77,C79,C86,C96 C97,C99,C106,C107 C123,C124,C130,C132 C135,C136,C138,C142 C169,C180,C182,C183 C193,C207,C217,C219 C220,C235,C350,C351	CB0319-00	CAP,CER .1UF 20% 50WV Z5U .2 SP AVX/SR215E104MAA	115

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ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
011	C352,C358,C361,C362, C363,C364,C366,C404 C405,C413,C414,C421 C424,C425,C433,C435 C436,C437,C455, C458,C463,C464,C465 C501,C502,C503,C506 C509,C520,C521,C522 C551,C552,C553,C554, C555,C559,C560,C561 C563,C564,C566,C567 C568,C570,C600,C602, C603,C604,C605,C651 C652,C653,C654,C685 C686,C695,C696,C697 C775,C778,C779 C817,C818,C823,	CB0319-00	CONTINUED FROM PREVIOUS PAGE AVX/SR215E104MAA	
012	C300,C780	CB1095-00	CAP,ALUM 330UF 20% 50WV GVG/A70-CB1095-00 A1	2
013	C16,C793,C795	CB2201-00	CAP,MICA D10 1PF +/-.5PF 500WV COD/CD10CD010D03	3
014	C172,C177,C194,C209, C214,C233,C788,C790, C791,C792	CB2203-00	CAP,MICA D10 3PF +/-.5PF 500WV COD/CD10CD030D03	10
015	C359,C401,C798,C810	CB2204-00	CAP,MICA D10 5PF +/-.5PF 500WV COD/CD10CD050D03	4
016	C26,C37,C56,C188 C201	CB2205-00	CAP,MICA D10 10PF 5% 500WV COD/CD10CD100J03	5
017	C804	CB2206-00	CAP,MICA D10 12PF 5% 500WV COD/CD10CD120J03	1
018	C192,C225	CB2210-01	CAP,MICA D10 22PF +/-1PF 500WV COD/CD10ED220C03	2
022	C126,C411,	CB2211-01	CAP,MICA D10 24PF +/-1PF 500WV COD/CD10ED240C03	2
023	C120,C360,C440,C569,	CB2212-01	CAP,MICA D10 27PF +/-1PF 500WV COD/CD10ED270C03	4
268	C111	CB2213-01	CAP,MICA D10 30PF +/-1PF 500WV COD/CD10ED300C03	1
301	C125,C143,C357,C365, C457,C800,	CB2214-01	CAP,MICA D10 33PF +/-1PF 500WV COD/CD10ED330C03	6
028	C409	CB2216-01	CAP,MICA D10 39PF +/-1PF 500WV COD/CD10ED390C03	1
029	C195,C234	CB2217-01	CAP,MICA D10 43PF +/-1PF 500WV COD/CD10ED430C03	2
019	C179,C216	CB2218-01	CAP,MICA D10 47PF 2% 500WV COD/CD10ED470G03	2
020	C121,C173,C210,	CB2220-01	CAP,MICA D10 51PF 1% 500WV COD/CD10ED510F03	3
030	C110,C353,C354,C571,	CB2221-00	CAP,MICA D10 56PF 5% 500WV COD/CD10ED560J03	4

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024	C441,C462,C164,C227	CB2223-01	CAP,MICA D10 68PF 1% 500WV COD/CD10ED680F03	4
033	C112	CB2225-00	CAP,MICA D10 82PF 5% 500WV COD/CD10ED820J03	1
027	C367,C171,C208	CB2226-01	CAP,MICA D10 91PF 1% 500WV COD/CD10FD910F03	3
032	C139,C141,C174,C211, C679	CB2227-01	CAP,MICA D10 100PF 1% 500WV COD/CD10FD101F03	5
041	C28,C41,C59	CB2229-01	CAP,MICA D10 120PF 1% 500WV COD/CD10FD121F03	3
037	C426	CB2231-00	CAP,MICA D10 150PF 5% 500WV COD/CD10FD151J03	1
043	C27,C34,C58	CB2234-01	CAP,MICA D10 200PF 1% 500WV COD/CD10FD201F03	3
039	C144,	CB2235-00	CAP,MICA D10 220PF 5% 500WV COD/CD10FD221J03	1
040	C412,C427	CB2239-00	CAP,MICA D10 300PF 5% 300WV COD/CD10FC301J03	2
042	C422,C504	CB2250-00	CAP,MICA D10 820PF 5% 100WV COD/D101F821JO3	2
034	C403	CB2252-00	CAP,MICA D10 1000PF 5% 100WV COD/D101F102JO3	1
267	C92,C122	CB2256-00	CAP,MICA D10 6PF +/-.5PF 500WV COD/CD10CD060D03	2
035	C176,C213,C187, C230	CB2258-00	CAP,MICA D10 8PF +/-.5PF 500WV COD/CD10CD080D03	4
044	C805,C806,C807,C808, C809	CB2259-00	CAP,MICA D10 9PF +/-.5PF 500WV COD/CD10CD090D03	5
036	C162,C200	CB2265-01	CAP,MICA D10 75PF 1% 500WV COD/CD10ED750F03	2
048	C95	CB4006-00	CAP,TANT 1UF 20% 35WV GVG/A70-CB4006-00 A1	1
047	C20,C21,C31,C32,C38, C39,C50,C51,C69,C80, C131,C133,C160,C161, C181,C218,C237,C407, C416,C420,C452,C453, C500,C671,C688,C689, C776,C777,C781,C782, C784,C787,C794,C824	CB4036-00	CAP,TANT 5.6UF 10% 20WV GVG/A70-CB4036-00 A1	34
264	C786	CB5001-00	CAP,VAR 2.5-9PF 100WV TOP GVG/A70-CB5001-00 A4	1
049	EJ1,EJ2	CC2073-00	CARD EJCTR,NYL BLK .062 THK PCB CAK/107-20	2
057	J12,J13,J14,J15,	CF0676-03	CONN,PL HDR 3POS 1ROW PCB MNT 3M/929647-01-03-30	4
251	J2,J3	CF1039-00	CONN,PL 96POS 3ROW RTANG PAN ONLY GVG/A70-CF1039-00 A1	2
038	J4,J5,J6,J7	CF1206-00	CONN,PL HDR 20POS 2ROW PCB MNT AMP/1-87227-0	4

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059	J8,J10:CUT PIN 53 J9,J11:CUT PIN 3	CF1720-00	CONN,PL HDR 56POS 2ROW VERT PCB MNT AMP/2-103186-8	4
252	J1 KEYED	CF1883-00	CONN,PL 96POS 3ROW RTANG PCB 5KEYED PAN/100-096-2007	1
060	Y450	CJ2059-00	CRYSTAL,14.318180MHZ HC49/U GVG/A70-CJ2059-00 A2	1
061	DL400	FA6003-00	FLTR,LO PASS 2 SECT BAL/FA6003-00	1
083		HB2036-00	HEAT SINK,TO-220 WSHR W/THRM FLM GVG/A70-HB2036-00 A1	2
062	HS300,HS301	HB2040-01	HEAT SINK,PLSTC PWR TRAN 1"H W/PINS AAV/60130-010PB	2
063	U20,30,U50	HB9003-10	HYBRID,VIDEO OP AMP,4 LOAD DRIVER GVG/HB9003-10	3
064	U15,U160,U161,U162, U200,U201,U202	HB9032-10	HYBRID,VIDEO BUFFER GVG/HB9032-10	7
067	U10	HB9049-10	HYBRID,EQUALIZING AMP (NPN OUTPUT)	1
068	U21,U31,U51	HB9061-00	HYBRID,ORION OUTPUT RES NETWORK GVG/HB9061-00	3
069	U97,U98	HB9065-00	HYBRID,SIP MULTIPLIER GVG/HB9065-00	2
070	U122	HB9069-00	HYBRID,2 INPUT NEG NAM GVG/HB9069-00	1
071	U120,U123	HB9069-10	HYBRID,2 INPUT POS NAM GVG/HB9069-10	2
072	U96	HB9078-00	HYBRID,VIDEO CLAMP GVG/HB9078-00	1
073	U95	HB9081-02	HYBRID,SYNC STRIPPER GVG/HB9081-02	1
075	U125,U126	HB9090-00	HYBRID,PULSE SHAPER GVG/HB9090-00	2
076	U501	HB9099-00	HYBRID,LINEAR V CONT DELAY GVG/HB9099-00	1
202	RN15	HB9118-00	HYBRID,RES NETWORK GVG/HB9118-00	1
074	U205,U782,U793	HB9120-00	HYBRID,SUBCARRIER FILTER GVG/HB9120-00	3
250	S1,S2,S3,S4	JA1006-00	JACK,SHTG RED PLSTC 2 CNT CAM/450-3775-01-0612	4
280	J12,J13	JA1009-00	JACK,SHTG BLK PLSTC 2 CNT AMP/530153-2	2
291	1 EA SB7006-00 1 EA SB7007-00	NA4002-00	NUT #4-40 1/16x3/16 H NUT,4-40,.0625X.1875,HEX,ZINC PL	2
077	R132,R501	PD2011-00	POT,TRIM CERMET 500 10% TOP BOR/3329H-1-501	2
084	R685	PD2025-00	POT,TRIM CERMET 200 10% TOP BOR/3329H-1-201	1
078	R136,R137,R138,R139	PD2028-00	POT,TRIM CERMET 20K 10% TOP BOR/3329H-1-203	4

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079	R187,R224,R238,R241, R250,R251,R254,R687	PD2033-00	POT,TRIM CERMET 100 10% TOP BOR/3329H-1-101	8
081	R178,R215,R678,R694,	PD2038-00	POT,TRIM CERMET 100K 10% TOP BOR/3329H-1-104	4
080	R196,R227	PD2058-00	POT,TRIM 50 OHM 10% TOP BOR/3329H-1-500	2
082	R416,R417	RB2100-00	RES,10 OHM 2% 1/4W MTL FLM GVG/A70-RB2100-00 A1	2
087	R422	RB2105-00	RES,1 MEG OHM 2% 1/4W MTL FLM GVG/A70-RB2105-00 A1	1
089	R409,R435,R514	RB2154-00	RES,150K OHM 2% 1/4W MTL FLM GVG/A70-RB2154-00 A1	3
287	R672,R677	RB2220-00	RES,22 OHM 2% 1/4W MTL FLM GVG/A70-RB2220-00 A1	2
098	R517	RB2224-00	RES,220K OHM 2% 1/4W MTL FLM GVG/A70-RB2224-00 A1	1
273	R79	RB2300-00	RES,30 OHM 2% 1/4W MTL FLM GVG/A70-RB2300-00 A1	1
107	R180,R211,R698,R700	RB2334-00	RES,330K OHM 2% 1/4W MTL FLM GVG/A70-RB2334-00 A1	4
105	R423	RB2394-00	RES,390K OHM 2% 1/4W MTL FLM GVG/A70-RB2394-00 A1	1
113	R427,R511,R692	RB2623-00	RES,62K OHM 2% 1/4W MTL FLM GVG/A70-RB2623-00 A1	3
274	R688,R693	RD0005-00	RES,.5 OHM 5% 1/2W CARB FILM GVG/A70-RD0005-00 A1	2
118	RN782,RN650,RN789	RN0059-00	RES NTWK,47K OHM 9 RES 10 SIP AB/710A473	3
119	RN65,RN66,RN67,RN68	RN0081-00	RES NTWK,10K OHM 9 RES 10 SIP AB/710A103	4
217	RN783,RN784,RN785, RN786,RN787,RN788	RN0131-00	RES NTWK,22 OHM 4 RES 8 SIP AB/708B220	6
055	RN790,RN791,RN792, RN793	RN0143-00	RES NTWK,47 OHM 8 RES 16 DIP BEK/898-3-R47	4
256	R103,R104,R121,R124 R656,R657,R691,R696, R697,R699,	RV1000-00	RES,100 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 100 OHM 1%	10
120	R2,R94,R174,R176, R192,R217,R228,R229, R231,R235,R236,R258, R306,R307,R401,R402, R403,R408,R412,R414, R433,R459,R552,R653, R662,R666,R675,	RV1001-00	RES,1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1K 1%	27
121	R80,R100,R130,R135, R184,R185,R221,R222, R426,R430,R451,R457, R502,R508,R654,R655, R670,R680,R681,	RV1002-00	RES,10K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 10K 1%	19
271	R661,R665	RV1002-03	RES,10K OHM .1% 1/8W MTL FLM	2

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			DAL/CMF-55 T-2 10K .1%	
122	R78,R413,R432,R436, R452,R503	RV1003-00	RES,100K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 100K 1%	6
109	R214	RV1021-00	RES,1.02K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.02K 1%	1
277	R194,R195,R233,R234	RV1051-03	RES,1050 OHM .1% 1/8W MTL FLM DAL/CMF-55 T2 1.05K .1%	4
288	R660	RV1101-00	RES,1.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.1K 1%	1
108	R134	RV1151-00	RES,1.15K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.15K 1%	1
123	R357	RV1211-00	RES,1.21K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.21K 1%	1
263	R105,R123	RV1240-00	RES,124 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 124 OHM 1%	2
224	R127	RV1302-00	RES,13K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 13K 1%	1
162	R667	RV1303-00	RES,130K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 130K 1%	1
285	R682	RV1331-00	RES,1.33K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.33K 1%	1
090	R140,R141	RV1433-00	RES,143K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 143K 1%	2
141	R175,R160,R165,R200, R207,R212,R102 R120,R122,R106	RV1501-00	RES,1.5K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.5K 1%	10
278	R510	RV1502-00	RES,15K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 15K 1%	1
173	R213	RV1691-00	RES,1.69K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.69K 1%	1
111	R128,R129	RV1821-00	RES,1.82K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.82K 1%	2
258	R189,R226,R671	RV2000-00	RES,200 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 200 OHM 1%	3
226	R407	RV2001-00	RES,2K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 2K 1%	1
227	R131,R668	RV2002-00	RES,20K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 20K 1%	2
128	R97,R429,R669,R673, R679	RV2210-00	RES,221 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 221 OHM 1%	5
129	R516,R354,R352,R405 MOD 01-3	RV2211-00	RES,2.21K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 2.21K 1%	5
228	R179,R216,R410,R420, R437,R507,R509,R513	RV2212-00	RES,22.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 22.1K 1%	8
286	R500	RV2491-00	RES,2.49K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 2.49K 1%	1
131	R239,R355,R651	RV2740-00	RES,274 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 274 OHM 1%	3
229	R415,R505,	RV2742-00	RES,27.4K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 27.4K 1%	2

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133	R164,R171,R172,R181, R204,R208,R209,R218, R686	RV3010-03	RES,301 OHM .1% 1/8W MTL FLM DAL/CMF-55 T-2 301 OHM .1%	9
230	R11,R163,R203	RV3320-00	RES,332 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 332 OHM 1%	3
231	R142,R243,R257,R360, R512	RV3321-03	RES,3.32K OHM .1% 1/8W MTL FILM DAL/CMF-55 T-2 3.32K .1%	5
197	R553,R676,R690	RV3322-00	RES,33.2K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 33.2K 1%	3
137	R351,R359,R601,R602, R603	RV3920-00	RES,392 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 392 OHM 1%	5
232	R421,R434,R554,R555 R556	RV3921-00	RES,3.92K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 3.92K 1%	5
276	R162,R167,R201,R206,	RV4220-03	RES,422 OHM .1% 1/8W MTL FLM DAL/CMF-55 T2 422 OHM .1%	4
234	R188,R225	RV4320-00	RES,432 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 432 OHM 1%	2
235	R358,R361, R550,R551	RV4751-00	RES,4.75K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 4.75K 1%	4
138	R12,R242,R362,R400, R406,R431,R684	RV4990-00	RES,499 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 499 OHM 1%	7
139	R75,R76,R125,R126, R133,R674	RV4991-00	RES,4.99K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 4.99K 1%	6
140	R96,R232,R237,R450, R454,R455,R504,R515, R518,R652,R695, TACKY:01-2 (R506)	RV4992-00	RES,49.9K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 49.9K 1%	12
257	R77	RV5620-00	RES,562 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 562 OHM 1%	1
237	R183,R220,R428	RV6810-00	RES,681 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 681 OHM 1%	3
238	R186,R223	RV6811-00	RES,6.81K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 6.81K 1%	2
220	R177,R353	RV7500-00	RES,750 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 750 OHM 1%	2
275	R456	RV7501-00	RES,7.5K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 7.5K 1%	1
240	R600	RV7509-00	RES,75 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 75 OHM 1%	1
241	R256 R240,R253,R255	RV8250-00	RES,825 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 825 OHM 1%	4
266	R10	RV8251-00	RES,8.25K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 8.25K 1%	1
142	R350	RV9091-00	RES,9.09K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 9.09K 1%	1
170	R20,R30,R50	RV9099-00	RES,90.9 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 90.9 OHM 1%	3
290	1 EA SB7006-00 1 EA SB7007-00	SA1054-01	SCRW,MACH 4-40X.3125L PH PNH W/NYL	2
262	4 EA 024700-00	SA1401-01	SCRW,MACH 2-56X.625 PH PNHD W/NYL	4

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			FFT/MACH 2-56X.625 PH PNHD SST W/NL	
143	D10,D11,D75,D76,D130 D131,D132,D133,D134 D135,D350,D351,D500, D501,D502,D504,D505, D550,D551,D552,D553, D554,D555,D556,D557, D558,D561	SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	27
279	D559,D560	SB4003-00	DIODE,ZENER 1N5231B 5.1V@20MA GVG/A70-SB4003-00 A2	2
144	D450	SB5010-00	DIODE,VARC MV1404 DO-204AA 96-144PF GVG/A70-SB5010-00 A1	1
145	Q450	SB6008-00	TRANS,NJFET MPF4392 TO-92 GVG/A70-SB6008-00 A1	1
242	Q1,Q2	SB6018-00	TRANS,FET SD215 TO-72-33 CLG/SD215DEG	2
146	Q506	SB7006-00	TRANS,PNP MJE371 TO-225AA PWR GVG/A70-SB7006-00 A2	1
147	Q504	SB7007-00	TRANS,NPN MJE521 TO-225AA PWR GVG/A70-SB7007-00 A1	1
106	Q505,Q507	SB8003-00	TRANS,NPN 2N4124 TO-92 SM-SIG GVG/A70-SB8003-00 A1	2
149	Q95,Q420,Q503	SB8004-00	TRANS,PNP 2N4126 TO-92 SM-SIG GVG/A70-SB8004-00 A2	3
150	Q3	SB8005-00	TRANS,NPN 2N4265 TO-92 SM-SIG GVG/A70-SB8005-00 A3	1
151	Q130 Q500	SB8021-00	TRANS,PNP MPS3640 TO-92 SM-SIG GVG/A70-SB8021-00 A2	2
152	Q350,Q352	SB8022-00	TRANS,NPN SPS7348 TO-92 SM-SIG CSC/CEN625	2
153	Q351,Q501,Q502	SB8023-00	TRANS,PNP MPS6523 TO-92 SM-SIG GVG/A70-SB8023-00 A1	3
154	Q96,Q120	SB8026-00	TRANS,NPN MPS6507 TO-92 SM-SIG GVG/A70-SB8026-00 N	2
155	Q97,Q121	SB8035-00	TRANS,PNP MPSH81 TO-92 SM-SIG GVG/A70-SB8035-00 A2	2
158	U206,U500,U781	SC0125-01	IC,LIN CA3080E 8 DIP GVG/A70-SC0125-01 A2	3
159	U350	SC0156-00	IC,LIN MC1496L 14 DIP GVG/A70-SC0156-00 A2	1
281	U792	SC0451-00	IC,LIN MC1404AU5 8 DIP GVG/A70-SC0451-00 A1	1
163	U502,U505	SC0483-00	IC,HCMOS MC74HC4538N 16 DIP GVG/A70-SC0483-00 A2	2
164	U76,U564	SC0488-00	IC,LIN DAC0802LCJ 16 DIP ANG/DAC-08HD	2
167	U131	SC0612-00	IC,HCMOS 74HC14N 14 DIP GVG/A70-SC0612-00 A2	1
168	U78,U130,U163,U203, U14,U420,U451,U503,	SC0628-00	IC,LIN LF353N 8 DIP ANG/AD642JH	9

REPLACEMENT PARTS LIST

BRD,MULTISTD NTSC INTERFACE
ASSEMBLY NUMBER: 064702-03 ISSUE: D ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
168	U504	SC0628-00	CONTINUED FROM PREVIOUS PAGE ANG/AD642JH	
259	U655,U656,U799	SC0652-01	IC,FTTL 74F283PC 16 DIP NSC ONLY NSC/74F283PC	3
169	U600,U601,U602,U603	SC0696-00	IC,TTL SN74AS885NT 24 DIP GVG/A70-SC0696-00 A1	4
171	D160,D200	SC0897-00	IC,LIN LM336Z-2.5 VOLT REF TO-92 GVG/A70-SC0897-00 A2	2
172	U164,U204	SC0898-01	IC,LIN TDC1016N7C8 24 DIP GVG/A70-SC0898-01 A5	2
160	U520,U521,U522	SC0914-00	IC,ASIC GATE ARRAY NTSC SPG 44 PLCC GVG/A70-SC0914-00 A2	3
183	ECO# Z098 U121,U124,U351,	SC1005-00	IC,CMOS CDG308N 16 DIP CLG/CDG308N	3
282	U253 054188-00	SC1018-00	IC,MEM CY7C225-30PC 24 DIP AMD/AM27S25APC	1
244	U67 054105-00 U797 054110-01 U798 054110-01 U795 054204-03	SC1246-00	IC,PAL GAL16V8A-25PL 20 DIP AMD/PALCE16V8H-25PC/4	4
174	U85,U86	SC1344-00	IC,ASIC VID LINE DRVR 52 PLCC VTC/VS621PLJ	2
066	U791	SC1354-00	IC,LIN LM324N 14 DIP GVG/A70-SC1354-00 A1	1
176	U401	SC1410-00	IC,ASIC SYNC SEP & CLAMP 44 PLCC AT&T/LB1174AP	1
177	U421	SC1411-01	IC,ASIC COLORLOCK 44 PLCC AT&T/LB1182BP	1
179	U402,U604,U775	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	3
165	U506,U508,U608	SC1453-00	IC,ACMOS 74ACT74 14 DIP GVG/A70-SC1453-00 A2	3
178	U251,U651	SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC NSC/SCX6244UEC/V2	2
180	U552	SC1624-00	IC,ACMOS 74ACT244PC 20 DIP NSC/74ACT244PC	1
181	U68	SC1641-00	IC,ACMOS 74ACT245PC 20 DIP NSC/74ACT245PC	1
156	U65,U75,U565,U609	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	4
203	U776	SC1703-00	IC,ASIC DGTL FIR FLTR 144 PGA VLS/VF4680	1
157	U507	SC1712-00	IC,ACMOS 74ACT00 14 DIP GVG/A70-SC1712-00 A2	1
184	U77,U79,U254,U550, U551,U553,U557,U559, U561,U563,U610,U611, U650,U796	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	14
185	U788 054106-01 U252 054107-02	SC1714-00	IC,EPLD SAM448-25S 28 DIP ATR/EPS448PC-25	3

REPLACEMENT PARTS LIST

BRD,MULTISTD NTSC INTERFACE
ASSEMBLY NUMBER: 064702-03 ISSUE: D ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
185	U255 054107-02	SC1714-00	CONTINUED FROM PREVIOUS PAGE ATR/EPS448PC-25	
166	U66	SC1719-00	IC,ACMOS 74ACT573 20 DIP GVG/A70-SC1719-00 A2	1
182	U800	SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	1
222	U779 054108-00 U802 054205-00	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	2
254	U556 054104-01 U562 054104-01 U607 054101-02 U558 054103-01 U560 054103-01 U612 054100-02	SC1842-00	IC,EPLD EP610-35PC 24 DIP ATR/EP610-35PC	6
175	U121,U124,U351	SC1949-00	IC,I/F DG442DJ 16 DIP SIL ONLY SIL/DG442DJ	3
161	U606 054102-03 U790 054114-02	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	2
361	ECO# Z323 U606 054102-03 U790 054114-02 U556 054104-01 U562 054104-01 U607 054101-02 U558 054103-01 U560 054103-01 U612 054100-02	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	8
210	U131,U350 U402,U506,U507,U508, U604,U608,U775,U791	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	10
211	U65,U75,U76,U121, U124,U351,U502,U505, U564,U565,U609,U655, U656,U799	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	14
214	U164,U204,DL400	SE8019-05	SKT,IC 24 DIP .6 CB BLK STR LEG AMP/2-640361-3	3
209	U14,U78,U130,U163, U203,U206,U420,U451, U500,U503,U504,U781 U792	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	13
212	U66,U67,U68,U77,U79, U254,U550,U551,U552, U553,U557,U559,U561, U563,U610,U611,U650, U795,U796,U797,U798,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	21
213	U253,U556,U558,U560, U562,U600,U601,U602, U603,U606,U607,U612, U779,U790,U800,U802,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	16
215	U251,U401,U421,U651,	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK	7

REPLACEMENT PARTS LIST

BRD,MULTISTD NTSC INTERFACE
ASSEMBLY NUMBER: 064702-03 ISSUE: D ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
	U520,U521,U522		AMP/3-821688-1	
216	U85,U86	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	2
255	U776	SE8165-00	SKT,IC 145 PIN GRID ARRAY TIN MEY/MP145-16212D	1
218	U252,U255,U788	SE8166-00	SKT,IC 28 DIP .3 CB BLK BUR/DILB28SP-8JKT	3
316	U205,U782,U793,	SE8175-05	SKT,HYBRID 5PIN SIP MLM/714-99-105-31-012	3
312	U10,U125,U126,	SE8175-08	SKT,HYBRID 8PIN SIP MLM/714-99-108-31-012	3
313	U21,U31,U51,	SE8175-09	SKT,HYBRID 9PIN SIP MLM/714-99-109-31-012	3
310	U15,U120,U122,U123, U160,U161,U162,U200, U201,U202,RN15	SE8175-10	SKT,HYBRID 10PIN SIP MLM/714-99-110-31-012	11
311	U95,U96,U97,U98,	SE8175-15	SKT,HYBRID 15PIN SIP MLM/714-99-115-31-012	4
315	U501,	SE8175-16	SKT,HYBRID 16PIN SIP MLM/714-99-116-31-012	1
314	U20,U30,U50,	SE8175-18	SKT,HYBRID 18PIN SIP MLM/714-99-118-31-012	3
249	S1A,S1B,S2A,S2B S3A,S3B,S4A,S4B	TA6067-00	TUR PN,.04X.15L .0625 PCB GOLD CAM/460-2971-02-03-00	8
188	TP15,TP160,TP161, TP162,TP163,TP164, TP200,TP201,TP202, TP203,TP204,TP205, TP206,TP300,TP301, TP302,TP303,TP350, TP351,TP400,TP520, TP521,TP522,TP523, TP524,TP525,TP526, TP527,TP528,TP529, TP530,TP531,TP532, TP533,TP534,TP535 TP536,TP537,TP538, TP539,TP540,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	41
269	L97,L120	ZB4009-01	INDCTR,MINI .47UH 5% DAL/IM2-12-.47UH-5%	2
270	L121	ZB4012-01	INDCTR,MINI .82UH 5% DAL/IM2-12-.82UH-5%	1
189	L96	ZB4013-01	INDCTR,MINI 1UH 5% DEL/1025-20J	1
127	L450	ZB4015-00	INDCTR,MINI 1.5UH 10% DAL/IM2-12-1.5UH-10%	1
193	L350,L351,L352,	ZB4021-00	INDCTR,MINI 4.7UH 10% DAL/IM2-12-4.7UH-10%	3
194	L353	ZB4025-00	INDCTR,MINI 10UH 10% DAL/IM2-12-10UH-10%	1

REPLACEMENT PARTS LIST

BRD,MULTISTD NTSC INTERFACE
ASSEMBLY NUMBER: 064702-03 ISSUE: D ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
195	L422	ZB4029-00	INDCTR,MINI 22UH 10% DAL/IM2-12-22UH-10%	1
283	L105	ZB4030-01	INDCTR,MINI 27UH 5% DAL/IM2-12-27UH-5%	1
206	L11	ZB4032-01	INDCTR,MINI 39UH 5% DAL/IM2-12-39UH-5%	1
196	L421	ZB4038-00	INDCTR,MINI 120UH 10% DAL/IM2-12-120UH-10%	1
198	L420	ZB4045-00	INDCTR,MINI 470UH 10% DAL/IM2-12-470UH-10%	1
200	FB401,FB402,FB403, FB404	ZB4131-00	INDCTR,FERRITE BEAD 131 OHM@100MHZ FPC/2643021801	4
246	L8,L104	ZB4139-00	INDCTR,ADJ 7.6-11.4UH SHLD CLC/SLOT TEN-4-07	2
247	L9,L101	ZB4141-00	INDCTR,ADJ 22.4-33.6UH SHLD CLC/SLOT TEN-4-10	2
248	L12,L13,L102,L103	ZB4142-00	INDCTR,ADJ 5.2-7.8UH SHLD CLC/SLOT TEN-4-06	4
201	FB30,FB31,FB95,FB130 FB160,FB161,FB162, FB163,FB164,FB165, FB400	ZB4211-00	INDCTR,FERRITE BEAD WIRED 34 OHMS FER/11413-3B	11
265	L14,L100	ZB4224-00	INDCTR,ADJ 11.2-16.8UH SHIELDED CLC/SLOT TEN-4-08	2
272	L451,L452,L453	ZB4225-00	INDCTR,ADJ 0.80-1.0UH SHIELDED CLC/SLOT TEN-4-01	3

REPLACEMENT PARTS LIST

BRD,RECURSIVE MEMORY NTSC
ASSEMBLY NUMBER: 064703-01 ISSUE: B ECN: Z156

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D07/08	000000-00	REFERENCE DOCUMENTS	1
001		044703-00	PCB,RECURSIVE MEMORY	1
002	C1,C2,C3,C4,C5, C6,C7,C8,C9,C10, C11,C12,C13,C15,C16, C17,C18,C20,C21,C22, C23,C24,C25,C26,C27, C28,C29,C30,C31,C32, C33,C34,C35,C36,C37, C38,C39,C40,C41,C42, C43,C44,C45,C46,C47,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	45
005	J2,J3	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
004	J1	CF1800-00	CONN,RCPT 36POS 2ROW PCB MNT AMP/1-533010-8	1
006	J4,J5,J6,	CF1819-00	CONN,PL HDR 56POS 2ROW VERT PCB MNT AMP/2-102973-8	3
009	U29,U35,U43,	SC1149-00	IC,MEM IDT7216L-55J 68 PLCC AMD/AM29C516AJC	3
010	U7	SC1450-00	IC,ACMOS 74ACT02 14 DIP HAR/CD74ACT02E	1
011	U11,	SC1624-00	IC,ACMOS 74ACT244PC 20 DIP NSC/74ACT244PC	1
014	U31,U32,U37,U38,U41, U42,	SC1679-00	IC,ASIC DGTL MIXER/ACCUM 84 PLCC LSI/L1A5047	6
012	U2,	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	1
008	U5,U56,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	2
007	U25,U26,U27,U28,	SC1720-00	IC,ACMOS 74ACT157 16 DIP GVG/A70-SC1720-00 A1	4
013	U1,U3,U4,U57,	SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	4
024	U8 054167-00 U9 054168-00 U13 054169-00 U14 054169-00 U15 054169-00 U16 054169-00 U17 054169-00 U18 054169-00 U19 054169-00 U20 054169-00 U47 054169-00 U48 054169-00 U50 054169-00 U51 054169-00 U53 054162-01	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	22

REPLACEMENT PARTS LIST

BRD,RECURSIVE MEMORY NTSC
ASSEMBLY NUMBER: 064703-01 ISSUE: B ECN: Z156

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
024	U33 054170-00 U34 054164-00 U36 054165-00 U39 054166-00 U40 054173-00 U12 054174-00 U30 054175-00	SC1824-00	CONTINUED FROM PREVIOUS PAGE AMD/AMPALCE22V10H-25PC	
023	U54 054171-00 U55 054172-01	SC1842-00	IC,EPLD EP610-35PC 24 DIP ATR/EP610-35PC	2
123	ECO# Z323 U54 054171-10 U55 054172-11	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	2
017	U7	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	1
018	U2,U25,U26,U27,U28,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	5
019	U5,U11,U56,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	3
020	U1,U3,U4,U8,U9, U12,U13,U14,U15,U16, U17,U18,U19,U20,U30, U33,U34,U36,U39,U40, U47,U48,U50,U51,U53, U54,U55,U57,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	28
121	ECO# Z333 U29,U35,U43,	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK AMP/3-821689-3	3
021	U29,U35,U43,	SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY BUR/QILE68P-410T	3
122	ECO# Z333 U31,U32,U37,U38,U41, U42,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	6
022	U31,U32,U37,U38,U41, U42,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	6

REPLACEMENT PARTS LIST

BRD,RECURSIVE MEMORY PAL
ASSEMBLY NUMBER: 064703-10 ISSUE: B ECN: Z156

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D07/08	000000-00	REFERENCE DOCUMENTS	1
001		044703-00	PCB,RECURSIVE MEMORY	1
002	C1,C2,C3,C4,C5, C6,C7,C8,C9,C10, C11,C12,C13,C15,C16, C17,C18,C20,C21,C22, C23,C24,C25,C26,C27, C28,C29,C30,C31,C32, C33,C34,C35,C36,C37, C38,C39,C40,C41,C42, C43,C44,C45,C46,C47,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	45
005	J2,J3	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
004	J1	CF1800-00	CONN,RCPT 36POS 2ROW PCB MNT AMP/1-533010-8	1
006	J4,J5,J6,	CF1819-00	CONN,PL HDR 56POS 2ROW VERT PCB MNT AMP/2-102973-8	3
009	U29,U35,U43,	SC1149-00	IC,MEM IDT7216L-55J 68 PLCC AMD/AM29C516AJC	3
010	U7	SC1450-00	IC,ACMOS 74ACT02 14 DIP HAR/CD74ACT02E	1
011	U11,	SC1624-00	IC,ACMOS 74ACT244PC 20 DIP NSC/74ACT244PC	1
014	U31,U32,U37,U38,U41, U42,	SC1679-00	IC,ASIC DGTL MIXER/ACCUM 84 PLCC LSI/L1A5047	6
012	U2,	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	1
008	U5,U56,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	2
007	U25,U26,U27,U28,	SC1720-00	IC,ACMOS 74ACT157 16 DIP GVG/A70-SC1720-00 A1	4
013	U1,U3,U4,U57,	SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	4
024	U8 054167-00 U9 054168-00 U13 054169-00 U14 054169-00 U15 054169-00 U16 054169-00 U17 054169-00 U18 054169-00 U19 054169-00 U20 054169-00 U47 054169-00 U48 054169-00 U50 054169-00 U51 054169-00 U53 054162-02	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	22

REPLACEMENT PARTS LIST

BRD,RECURSIVE MEMORY PAL
ASSEMBLY NUMBER: 064703-10 ISSUE: B ECN: Z156

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
024	U33 054170-00 U34 054164-00 U36 054165-00 U39 054166-00 U40 054173-00 U12 054174-00 U30 054175-00	SC1824-00	CONTINUED FROM PREVIOUS PAGE AMD/AMPALCE22V10H-25PC	
023	U54 054171-10 U55 054172-11	SC1842-00	IC,EPLD EP610-35PC 24 DIP ATR/EP610-35PC	2
223	ECO# Z323 U54 054171-10 U55 054172-11	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	2
017	U7	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	1
018	U2,U25,U26,U27,U28,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	5
019	U5,U11,U56,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	3
020	U1,U3,U4,U8,U9, U12,U13,U14,U15,U16, U17,U18,U19,U20,U30, U33,U34,U36,U39,U40, U47,U48,U50,U51,U53, U54,U55,U57,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	28
121	ECO# Z333 U29,U35,U43,	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK AMP/3-821689-3	3
021	U29,U35,U43,	SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY BUR/QILE68P-410T	3
122	ECO# Z333 U31,U32,U37,U38,U41, U42,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	6
022	U31,U32,U37,U38,U41, U42,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	6

REPLACEMENT PARTS LIST

BRD,SEC CHNL COMBINER MEZZ 525/625
ASSEMBLY NUMBER: 064704-01 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	X1 FAB	044704-01	PCB,2 CHNNL COMBINER MEZZ 525/625	1
002	C2,C3,C4,C5,C6,C7, C8,C9,C10,C12,C13, C14,C16,C17,C18,C19, C20,C21,C22,C23,C24, C25,C26,C27,C28,C29, C30,C32,C34,C35,C36, C37,C38,C39,C40,C41, C42,C45,C46,C47,C48, C50,C51,C52,C53,C54, C55,C56,C57,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	49
029	C1,C11,C15,C31,C33, C43,C44,C49,	CB0366-00	CAP,CER 330PF 10% 200WV X7R KEM/C315C331K2R5CA	8
004	U1,U2,U5,	CF1853-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534206-8	3
003	J3,J4,	CF1860-00	CONN,RCPT 36POS 2ROW VERT PCB MNT AMP/1-534206-8	2
062	R1,R2,R3,R4,R5, R6,R7,R8,	RV7509-00	RES,75 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 75 OHM 1%	8
060	4 EA 064704	SA1053-01	SCRW,MACH 4-40X.25L PH PNH W/NYL MACH 4-40X.25L PH PNH W/NYL ZINC	4
008	U19 054149-00	SC1018-00	IC,MEM CY7C225-30PC 24 DIP AMD/AM27S25APC	1
005	U11,U13,U30,U31,	SC1149-00	IC,MEM IDT7216L-55J 68 PLCC AMD/AM29C516AJC	4
026	U25 054153-01 U10 054147-00	SC1246-00	IC,PAL GAL16V8A-25PL 20 DIP AMD/PALCE16V8H-25PC/4	2
006	U9,U24,U26,U39,U40, U41,U42,U43,U44,	SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC NSC/SCX6244UEC/V2	9
007	U20,U22,U23,	SC1624-00	IC,ACMOS 74ACT244PC 20 DIP NSC/74ACT244PC	3
009	U5,U6,	SC1643-00	IC,ACMOS 74ACT283PC 16 DIP HAR/CD74ACT283E	2
010	U27,U28,U45,U48,U49,	SC1679-00	IC,ASIC DGTL MIXER/ACCUM 84 PLCC LSI/L1A5047	5
011	U2,U18,U33,U37,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	4
012	U14,U15,U16,U17,	SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	4
013	U35	SC1730-00	IC,ACMOS 74ACT823 24 DIP GVG/A70-SC1730-00 A2	1
014	U29	SC1780-00	IC,FTTL 74F537 20 DIP GVG/A70-SC1780-00 A1	1
024	U12,U21,	SC1804-00	IC,ACMOS 74ACT399 16 DIP GVG/A70-SC1804-00 A1	2
063	U46,U47,	SC1805-00	IC,ACMOS 74ACT841 24 DIP GVG/A70-SC1805-00 A1	2
023	U1 054145-00	SC1822-00	IC,PAL 20V8 24 DIP 25NS AMD/PALCE20V8H-25	1

REPLACEMENT PARTS LIST

BRD,SEC CHNL COMBINER MEZZ 525/625
ASSEMBLY NUMBER: 064704-01 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
027	U3 054202-00	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP	7
	U4 054202-00		AMD/AMPALCE22V10H-25PC	
	U8 054143-00			
	U32 054154-00			
	U34 054155-00			
	U36 054154-00			
	U38 054155-00			
028	U7	SC7001-00	IC,ASIC S38BC017PM01 52 PLCC	1
			MOT/S38BC017PM01	
018	U5,U6,U12,U21,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG	4
			AMP/2-640358-3	
016	U2,U10,U18,U20,U22,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG	10
	U23,U25,U29,U33,U37,		AMP/2-640464-3	
017	U1,U3,U4,U8,U14,U15,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG	16
	U16,U17,U19,U32,U34,		AMP/2-641932-3	
	U35,U36,U38,U46,U47,			
020	U9,U24,U26,U39,U40,	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK	9
	U41,U42,U43,U44,		AMP/3-821688-1	
119	U11,U13,U30,U31	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK	4
			AMP/3-821689-3	
019		SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY	4
			BUR/QILE68P-410T	
055	U7	SE8094-03	SKT,IC 52 PLCC	1
			AMP/3-821739-3	
121	U27,U28,U45,U48,U49,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ	5
			AMP/3-821690-3	
021		SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY	5
			BUR/QILE84P-410T	
061	2 EA 064704	SF2048-00	SPCR,4-40 .25 HEX .4375L BRS ZINC	2
			GVG/A70-SF2048-00 A1	

REPLACEMENT PARTS LIST

BRD,NTSC ANLG INPUT SUBMODULE
ASSEMBLY NUMBER: 064705-01 ISSUE: J ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	TACKY INSTRUCTIONS 01-1	000000-00	REFERENCE DOCUMENTS	0
100		044705-01	PCB,NTSC ANALOG INPUT	1
006	C77,C80,C81,C86,C88, C90,C91,C92,C93	CB0142-00	CAP,CER .01UF 10% 100WV X7R .2 SP AVX/SR211C103KAA	9
005	C56	CB0281-00	CAP,CER 2200PF 10% 50WV X7R KEM/C317C222K5R5CA	1
002	C138,C139	CB0283-00	CAP,CER 1000PF 10% 50WV X7R KEM/C317C102K5R5CA	2
007	C50,C52,C60,C78,C79, C83,C84,C87,C94,C97, C98,C99,C100,C101, C102,C103,C104,C105, C106,C107,C108,C109, C110,C123,C140,C141	CB0319-00	CAP,CER .1UF 20% 50WV Z5U .2 SP AVX/SR215E104MAA	26
009	C23,C27,C31,C136	CB2203-00	CAP,MICA D10 3PF +/-.5PF 500WV COD/CD10CD030D03	4
011	C121	CB2205-00	CAP,MICA D10 10PF 5% 500WV COD/CD10CD100J03	1
028	C33,C135	CB2210-01	CAP,MICA D10 22PF +/-1PF 500WV COD/CD10ED220C03	2
078	C116,C134	CB2211-02	CAP,MICA D10 24PF +/-.5PF 500WV COD/CD10ED240D03	2
016	C95,C96,	CB2214-01	CAP,MICA D10 33PF +/-1PF 500WV COD/CD10ED330C03	2
008	C30	CB2217-01	CAP,MICA D10 43PF +/-1PF 500WV COD/CD10ED430C03	1
014	C20,C113	CB2218-01	CAP,MICA D10 47PF 2% 500WV COD/CD10ED470G03	2
015	C26	CB2220-01	CAP,MICA D10 51PF 1% 500WV COD/CD10ED510F03	1
089	C82,C89	CB2221-00	CAP,MICA D10 56PF 5% 500WV COD/CD10ED560J03	2
017	C35	CB2223-01	CAP,MICA D10 68PF 1% 500WV COD/CD10ED680F03	1
060	C28	CB2226-01	CAP,MICA D10 91PF 1% 500WV COD/CD10FD910F03	1
018	C22,C133	CB2227-01	CAP,MICA D10 100PF 1% 500WV COD/CD10FD101F03	2
026	C24,C119	CB2258-00	CAP,MICA D10 8PF +/-.5PF 500WV COD/CD10CD080D03	2
021	C37	CB2265-01	CAP,MICA D10 75PF 1% 500WV COD/CD10ED750F03	1
020	C111	CB2266-01	CAP,MICA D10 130PF 1% 500WV COD/CD10FD131F03	1
022	C129,C130	CB4026-00	CAP,TANT 2.2UF 20% 10WV NON POLAR AVX/TMNA-225M-010R	2
034	C125,C126,C127,C128 C131,C132,C137,	CB4036-00	CAP,TANT 5.6UF 10% 20WV GVG/A70-CB4036-00 A1	7

REPLACEMENT PARTS LIST

BRD,NTSC ANLG INPUT SUBMODULE
ASSEMBLY NUMBER: 064705-01 ISSUE: J ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
111	C118	CB5001-00	CAP,VAR 2.5-9PF 100WV TOP GVG/A70-CB5001-00 A4	1
024	J103	CF0676-03	CONN,PL HDR 3POS 1ROW PCB MNT 3M/929647-01-03-30	1
040	FOR J1 POSITION 53 J2 POSITION 3	CF1241-00	CONN,KEY PL NYL AMP/86286-1	2
025	J1,J2	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
027	U20,U110,U111	HB9032-20	HYBRID,VIDEO AMPLIFIER GVG/HB9032-20	3
029	U1,U4	HB9049-10	HYBRID,EQUALIZING AMP (NPN OUTPUT)	2
035	U113	HB9120-00	HYBRID,SUBCARRIER FILTER GVG/HB9120-00	1
030	R97,R100	PD2024-00	POT,TRIM CERMET 5K 10% TOP BOR/3329H-1-502	2
031	R61	PD2025-00	POT,TRIM CERMET 200 10% TOP BOR/3329H-1-201	1
032	R64	PD2027-00	POT,TRIM CERMET 2K 10% TOP BOR/3329H-1-202	1
036	R4,R6	RB2105-00	RES,1 MEG OHM 2% 1/4W MTL FLM GVG/A70-RB2105-00 A1	2
048	R5,R8,R50	RV1000-00	RES,100 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 100 OHM 1%	3
051	R60,R88,R93,R95,R98 R99,R101	RV1001-00	RES,1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1K 1%	7
053	R59,R79,R81 R86,R94	RV1002-00	RES,10K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 10K 1%	5
038	R58	RV1152-00	RES,11.5K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 11.5K 1%	1
092	R83,R84	RV1500-00	RES,150 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 150 OHM 1%	2
052	R20,R31,R32	RV1501-00	RES,1.5K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.5K 1%	3
054	R57,R62 TACKY: 01-1	RV2210-00	RES,221 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 221 OHM 1%	3
037	R96	RV2741-00	RES,2.74K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 2.74K 1%	1
055	R21,R26,R28,R29 R30,R33,R34	RV3010-03	RES,301 OHM .1% 1/8W MTL FLM DAL/CMF-55 T-2 301 OHM .1%	7
042	R1,R7	RV3320-00	RES,332 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 332 OHM 1%	2
043	R67,R102	RV3321-03	RES,3.32K OHM .1% 1/8W MTL FILM DAL/CMF-55 T-2 3.32K .1%	2
056	R2,R10	RV4990-00	RES,499 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 499 OHM 1%	2
045	R65,R66,R75,R77,R80 R85,R87	RV4992-00	RES,49.9K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 49.9K 1%	7
093	R76,R78	RV6811-00	RES,6.81K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 6.81K 1%	2

REPLACEMENT PARTS LIST

BRD,NTSC ANLG INPUT SUBMODULE
ASSEMBLY NUMBER: 064705-01 ISSUE: J ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
041	R103,R104	RV7509-00	RES,75 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 75 OHM 1%	2
070		SA1052-01	SCRW,MACH 4-40X.1875L PH PNH W/NYL MACH 4-40X.1875L PH PNH W/NYL ZINC	8
057	D1,D2,D3,D4,D77,D78	SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	6
058	D80	SB5011-00	DIODE,VARC MV2110 TO-226AC 35-42PF GVG/A70-SB5011-00 O	1
059	Q1,Q2	SB6018-00	TRANS,FET SD215 TO-72-33 CLG/SD215DEG	2
061	Q50	SB8004-00	TRANS,PNP 2N4126 TO-92 SM-SIG GVG/A70-SB8004-00 A2	1
110	Q51	SB8005-00	TRANS,NPN 2N4265 TO-92 SM-SIG GVG/A70-SB8005-00 A3	1
063	U53	SC0125-01	IC,LIN CA3080E 8 DIP GVG/A70-SC0125-01 A2	1
064	U79	SC0250-00	IC,CMOS MC14052BCP 16 DIP GVG/A70-SC0250-00 A1	1
065	U78	SC0488-00	IC,LIN DAC0802LCJ 16 DIP ANG/DAC-08HD	1
067	U52,U75	SC0628-00	IC,LIN LF353N 8 DIP ANG/AD642JH	2
068	D81	SC0897-00	IC,LIN LM336Z-2.5 VOLT REF TO-92 GVG/A70-SC0897-00 A2	1
069	U2,U3	SC1093-01	IC,LIN XPT -11MV TO -25MV DC EXR/XR-C0668A	2
098	U106	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	1
082	U116,U122	SC1453-00	IC,ACMOS 74ACT74 14 DIP GVG/A70-SC1453-00 A2	2
083	U80,U112	SC1454-00	IC,ACMOS 74AC86 14 DIP GVG/A70-SC1454-00 A2	2
071	U83	SC1624-00	IC,ACMOS 74ACT244PC 20 DIP NSC/74ACT244PC	1
073	U50	SC1676-01	IC,LIN TDC1038N6C 28 DIP TRW ONLY GVG/A70-SC1676-01 A1	1
074	U84	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	1
075	U103,U104	SC1702-00	IC,ASIC NTSC/PAL ENC/DEC 120 PGA VLS/VF4678	2
062	U114,U115,U119,U120,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	4
076	U100,U101	SC1718-00	IC,ASIC DGTL VID 4-LN DLY 84 PLCC VLS/VF4696	2
091	U118	SC1720-00	IC,ACMOS 74ACT157 16 DIP GVG/A70-SC1720-00 A1	1
097	U76,U77	SC1906-00	IC,MEM TMS4C1050-40N 16 DIP OKI/MSM514221-6RS	2
080	ECO# Z253 U100,U101,	SC2060-00	IC,ASIC DGTL 4 LN DLY/ADDS 84 PLCC NSC/MM9249	2

REPLACEMENT PARTS LIST

BRD,NTSC ANLG INPUT SUBMODULE
ASSEMBLY NUMBER: 064705-01 ISSUE: J ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
084	U80,U106,U112,U116, U122	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	5
085	U76,U77,U78,U79, U84,U118	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	6
086	U52,U53,U75	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	3
087	U83,U114,U115,U119, U120,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	5
088	U50	SE8035-05	SKT,IC 28 DIP.6 CB BLK STR LEG AMP/2-640362-3	1
196	ECO#Z333 U100,U101,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	2
096	U100,U101	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	2
090	U103,U104	SE8167-00	SKT,IC 121 PGA 13X13 LIF AMP/55273-2	2
120	U113	SE8175-05	SKT,HYBRID 5PIN SIP MLM/714-99-105-31-012	1
121	U1,U4,	SE8175-08	SKT,HYBRID 8PIN SIP MLM/714-99-108-31-012	2
122	U20,U110,U111,	SE8175-10	SKT,HYBRID 10PIN SIP MLM/714-99-110-31-012	3
066	FOR MOUNTING ON 064702-00	SF2003-00	SPCR,4-40 .25 HEX .375L BRS ZINC GVG/A70-SF2003-00 A1	4
077	TP20,TP50,TP51,TP75 TP76,TP77,TP78 TP79,TP80,TP81,TP82 TP83,TP84	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	13
094	L75,L76,L77	ZB4011-01	INDCTR,MINI .68UH 5% DAL/IM2-12-.68UH-5%	3
079	L85	ZB4019-01	INDCTR,MINI 3.3UH 5% DAL/IM2-12-3.3UH-5%	1
104	L82	ZB4139-00	INDCTR,ADJ 7.6-11.4UH SHLD CLC/SLOT TEN-4-07	1
102	L80	ZB4141-00	INDCTR,ADJ 22.4-33.6UH SHLD CLC/SLOT TEN-4-10	1
101	L81,L83	ZB4142-00	INDCTR,ADJ 5.2-7.8UH SHLD CLC/SLOT TEN-4-06	2
081	FB1,FB2,FB51,FB75 FB76,FB77,FB100 FB101,FB102,	ZB4211-00	INDCTR,FERRITE BEAD WIRED 34 OHMS FER/11413-3B	9
095	L79	ZB4224-00	INDCTR,ADJ 11.2-16.8UH SHIELDED CLC/SLOT TEN-4-08	1
106	L78	ZB4225-00	INDCTR,ADJ 0.80-1.0UH SHIELDED CLC/SLOT TEN-4-01	1

REPLACEMENT PARTS LIST

BRD,EXTENDER CPU/DGTL VIDEO
ASSEMBLY NUMBER: 064708-00 ISSUE: C ECN: Z008

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10	000000-00	REFERENCE DOCUMENTS	0
001		044708-00	PCB,EXTENDER CPU/DGTL	1
004	J1,J3 (TO M./BD.)	CF1039-00	CONN,PL 96POS 3ROW RTANG PAN ONLY GVG/A70-CF1039-00 A1	2
002	J4,J6 (TO AIF BD)	CF1814-00	CONN,RCPT 96POS 3ROW RTANG PCB MNT GVG/A70-CF1814-00 A2	2
005	J2 KEYED TO MOTHER BOARD.	CF1883-00	CONN,PL 96POS 3ROW RTANG PCB 5KEYED PAN/100-096-2007	1
003	J5 KEYED TO 5 DIGITAL/CPU BOARDS.	CF1884-00	CONN,RCPT 96POS 3ROW RTANG PCB 5KEY PAN/100-096-2009	1
010	RN3,RN6 PIN PAIRS: 1-16, 2-15,3-14,4-13, 5-12,6-11,7-10,8-9 RN9; PIN PAIRS: 1-16, 2-15,3-14,4-13, 5-12,6-11,8-9 RN10,RN13,RN16; PIN PAIRS: 1-16, 2-15,3-14,4-13, 5-12,6-11,7-10 RN21,RN24,RN27; PIN PAIRS: 1-16, 2-15,3-14,4-13, 5-12,7-10,8-9	RB2000-00	RES,0 OHM 5% 1/4W MTL FLM GVG/A70-RB2000-00 A3	65
011	RN9; PIN PAIR: 7-10 RN10,RN13,RN16; PIN PAIR: 8-9 RN21,RN24,RN27; PIN PAIR: 6-11	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	7
006	RN1,RN2,RN4,RN5,RN7, RN8,RN11,RN12,RN14, RN15,RN17,RN18,RN19, RN20,RN22,RN23,RN25, RN26,RN28,RN29,RN30, RN31,RN32,RN33,RN34 RN35,RN36	RN0143-00	RES NTWK,47 OHM 8 RES 16 DIP BEK/898-3-R47	27

REPLACEMENT PARTS LIST

BRD,CTRL PNL SWITCH
ASSEMBLY NUMBER: 064709-00 ISSUE: F ECN: W940

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,B07/08	000000-00	REFERENCE DOCUMENTS	0
100		044709-00	PCB,CONTROL PANEL SWITCH	1
001	C2,C9,C10,C11,C16, C44,C45,C46,C47,C48, C49,C50,C51,C52,C53, C54	CB0142-00	CAP,CER .01UF 10% 100WV X7R .2 SP AVX/SR211C103KAA	16
002	C24,C26,C27,C28,C29 C30,C31,C32,C33,C34 C35,C36,C37,C39,C55 C56,C57,C58,C64,C68 C69,C71,C74,C75	CB0319-00	CAP,CER .1UF 20% 50WV Z5U .2 SP AVX/SR215E104MAA	24
006	C59,C60	CB0353-00	CAP,ALUM 470UF -10+100% 12WV SPR/672D477H012DM5RS	2
003	C25	CB2244-00	CAP,MICA D10 470PF 5% 100WV COD/D101F471JO	1
004	C3,C23,C38,C65 C66,C67,C70,C72	CB4022-00	CAP,TANT 22UF 10% 15WV GVG/A70-CB4022-00 A1	8
007	J8	CF0626-00	CONN,PL 6POS 1ROW PCB MNT AMP/207378-1	1
005	J7,J9,J10,J11	CF0676-03	CONN,PL HDR 3POS 1ROW PCB MNT 3M/929647-01-03-30	4
008	J5	CF1171-00	CONN,PL HDR 50POS 2ROW PCB MNT AMP/2-102973-5	1
009	J3	CF1482-00	CONN,PL HDR 26POS 2ROW PCB RTANG AMP/1-87230-3	1
048	J4	CF1835-00	CONN,PL HDR 12POS 1ROW RTANG PCB MT MOL/22-12-1122	1
010	Y2	CJ2048-00	CRYSTAL,1.2288MHZ 14 DIP DAL/X0-43B 1.2288MHZ	1
039	R8,R9	PD0114-00	POT,DUAL 5K/5K 20% 360 DEG ROT CLA/PD0114-00	2
012	DS14,DS15,DS16,DS17 DS18,DS19,DS20,DS21 DS22,DS23,DS24	RA4024-00	RDOUT DSPL,LED DUAL .3 HGT RED GI/MAN74A	11
015	R10,R13	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	2
013	R4	RB2223-00	RES,22K OHM 2% 1/4W MTL FLM GVG/A70-RB2223-00 A1	1
017	R6	RB2240-00	RES,24 OHM 2% 1/4W MTL FLM GVG/A70-RB2240-00 A1	1
014	R5	RB2331-00	RES,330 OHM 2% 1/4W MTL FLM GVG/A70-RB2331-00 A1	1
016	RN4,RN5,RN6,RN38	RN0059-00	RES NTWK,47K OHM 9 RES 10 SIP AB/710A473	4
018	RN37,RN39	RN0115-00	RES NTWK,330 OHM 8 RES 16 DIP BOR/4116R-001-331	2
019	RN20,RN21,RN22,RN25 RN36,RN40,RN41,RN42	RN0171-00	RES NTWK,100 OHM 16 DIP BOR/4116R-001-101	9

REPLACEMENT PARTS LIST

BRD,CTRL PNL SWITCH
ASSEMBLY NUMBER: 064709-00 ISSUE: F ECN: W940

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
019	RN43	RN0171-00	CONTINUED FROM PREVIOUS PAGE BOR/4116R-001-101	
045	R15	RV2102-00	RES,21K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 21K 1%	1
046	R16	RV2212-00	RES,22.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 22.1K 1%	1
049	U38,U58	SB1051-00	DIODE,LED HLMP2885 GRN .350X.750 GVG/A70-SB1051-00 A2	2
020	U36,U37	SB1052-00	DIODE,LED HMLP2855 FRN .350X.350-SQ GVG/A70-SB1052-00 A2	2
078	D79	SB1066-50	DIODE,SIG 1N5711 SCHOTTKY .4-BEND HP/1N5711	1
021	D1,D2,D3,D4,D5,D6 D8,D9,D10,D11,D12 D13,D14,D15,D16,D17 D18,D19,D20,D21,D22 D23,D24,D25,D26,D27 D28,D29,D30,D31,D32 D33,D34,D35,D36,D37 D38,D39,D40,D41,D42 D43,D44,D45,D46,D47 D48,D49,D50,D52,D53 D54,D55,D56,D57,D58 D59,D60,D61,D62,D63 D64,D65,D66,D67,D68 D69,D70,D71,D72,D73 D74,D75,D76,D77,D78	SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	76
047	Q18	SB8003-00	TRANS,NPN 2N4124 TO-92 SM-SIG GVG/A70-SB8003-00 A1	1
050	Q3,Q4,Q5,Q6,Q7 Q8,Q9,Q10,Q11,Q12 Q13	SB8045-00	TRANS,NPN PN2222A TO-92 SM-SIG GVG/A70-SB8045-00 A1	11
043	Q14,Q15,Q16,Q17	SB8063-00	TRANS,NPN MPS650 TO-92 SM-SIG GVG/A70-SB8063-00 A1	4
023	U42	SC0335-00	IC,LIN LF398N 8 DIP GVG/A70-SC0335-00 A1	1
022	U60	SC0352-00	IC,LIN LF351N 8 DIP GVG/A70-SC0352-00 A2	1
025	U40,U41	SC1123-00	IC,HCMOS 74HC4051 16 DIP MOT ONLY GVG/A70-SC1123-00 A2	2
026	U16,U59	SC1311-00	IC,ACMOS 74ACT374PC 20 DIP GVG/A70-SC1311-00 A2	2
024	U12	SC1453-00	IC,ACMOS 74ACT74 14 DIP GVG/A70-SC1453-00 A2	1
027	U33	SC1609-00	IC,ACMOS 74AC139 16 DIP GVG/A70-SC1609-00 A2	1
037	U43	SC1686-00	IC,CMOS MAX172BCNG 24 DIP GVG/A70-SC1686-00 A1	1
028	U31,U32,U54	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	3

REPLACEMENT PARTS LIST

BRD,CTRL PNL SWITCH
ASSEMBLY NUMBER: 064709-00 ISSUE: F ECN: W940

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
036	U44,U45,U46,U47,U48 U49,U50,U51,U52,U53	SC1733-00	IC,I/F DP8310N 20 DIP GVG/A70-SC1733-00 A1	10
038	U55,U56,U57	SC1773-00	IC,I/F MM74C911 28 DIP GVG/A70-SC1773-00 A1	3
030	U12	SE8006-00	SKT,IC 14 DIP .3 CB BLK AMP/2-641261-3	1
031	U31,U32,U33,U40, U41,U54	SE8011-00	SKT,IC 16 DIP .3 CB BLK AMP/2-641262-3	6
029	U42,U60	SE8021-00	SKT,IC 8 DIP .3 CB BLK LOW PF AMP/2-641260-3	2
032	U44,U45,U46,U47, U48,U49,U50,U51, U52,U53,U59,U16	SE8034-00	SKT,IC 20 DIP .3 CB BLK AMP/2-641264-3	12
034	U55,U56,U57	SE8035-00	SKT,IC 28 DIP .6 CB BLK AMP/2-641267-3	3
033	U43	SE8043-00	SKT,IC 24 DIP .3 CB BLK AMP/2-641933-3	1
042	DS14,DS15,DS16,DS17, DS18,DS19,DS20,DS21, DS22,DS23,DS24,DS36, DS37,DS38,DS58	SE8178-00	SKT,IC 16 DIP .2 WW ELEVATOR ARI/1108264	15
040	S1,S2,S3,S4,S5,S7, S8,S9,S10,S11,S12, S13,S14,S15,S16,S17, S18,S19,S20,S21,S22, S23,S24,S25,S26,S27, S28,S29,S30,S31,S32, S33,S34,S35,S36,S37, S38,S39,S40,S41,S42, S43,S44,S45,S46,S47, S48,S49,S51,S52,S53, S54,S55,S56,S57,S58, S59,S60,S61,S62,S63, S64,S65,S66,S67,S68, S69,S70,S71,S72,S73, S74,S75,S76,S77, ECO# Z209	SJ0230-01	SW,LT PB MOM SPST ISD/603073	75
041	ECO# Z209 S1,S2,S3,S4,S5,S7, S8,S9,S10,S11,S12, S13,S14,S15,S16,S17, S18,S19,S20,S21,S22, S23,S24,S25,S26,S27, S28,S29,S30,S31,S32, S33,S34,S35,S36,S37, S38,S39,S40,S41,S42, S43,S44,S45,S46,S47, S48,S49,S51,S52,S53, S54,S55,S56,S57,S58, S59,S60,S61,S62,S63,	SJ0230-02	SW,LT PB MOM SPST ISD/603216	75

REPLACEMENT PARTS LIST

BRD,CTRL PNL SWITCH
ASSEMBLY NUMBER: 064709-00 ISSUE: F ECN: W940

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
041	S64,S65,S66,S67,S68, S69,S70,S71,S72,S73, S74,S75,S76,S77,	SJ0230-02	CONTINUED FROM PREVIOUS PAGE ISD/603216	

REPLACEMENT PARTS LIST

BRD,CNTL PNL PROCESSOR
ASSEMBLY NUMBER: 064710-00 ISSUE: M ECN: Z208

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10, B07/08 TACKY INSTRUCTIONS: 00-1	000000-00	REFERENCE DOCUMENTS	0
100		044710-00	PCB,CONTROL PANEL PROCESSOR	1
001	BP1	BD4003-00	BUZZER,5V SOLID STATE WASHABLE SMX/HMB-06	1
087	C162	CB0119-00	CAP,CER .22UF 10% 50WV X7R AVX/SR305C224KAA	1
089	C112,C144	CB0130-00	CAP,CER 1.OUF 20% 50WV Z5U .2 SP AVX/SR305E105ZAA	2
086	C122,C139	CB0142-00	CAP,CER .01UF 10% 100WV X7R .2 SP AVX/SR211C103KAA	2
154	C161	CB0263-00	CAP,TANT .22UF 10% 35WV KEM/T350A224K035AS	1
004	C43,C44,C45,C46,C47 C48,C49,C50,C51,C52 C53,C54,C55,C56,C57 C58,C59,C60,C61,C62 C63,C64,C65,C66,C67 C68,C69,C70,C71,C72 C73,C74,C75,C76,C77 C78,C79,C80,C81,C82 C83,C84,C85,C86,C87	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	45
002	C116,C146,C186	CB0281-00	CAP,CER 2200PF 10% 50WV X7R KEM/C317C222K5R5CA	3
084	C125,C135,C198	CB0283-00	CAP,CER 1000PF 10% 50WV X7R KEM/C317C102K5R5CA	3
085	C136	CB0284-00	CAP,CER 4700PF 10% 50WV X7R KEM/C317C472K5R5CA	1
003	C137,C185	CB0285-00	CAP,CER .047UF 10% 50WV X7R KEM/C322C473K5R5CA	2
088	C111,C113,C115,C133, C140	CB0286-00	CAP,CER .022UF 10% 50WV X7R KEM/C322C223K5R5CA	5
005	C88,C89,C90,C91,C92 C93,C94,C95,C96,C97 C98,C99,C100,C110 C114,C117,C118,C121 C124,C126,C129,C130 C138,C141,C142,C145 C147,C148,C152,C153 C154,C155,C159,C164 C190,C191,C192,C194 C199,C200,C201,C202	CB0319-00	CAP,CER .1UF 20% 50WV Z5U .2 SP AVX/SR215E104MAA	42
153	C156	CB0360-00	CAP,TANT 47UF 10% 35WV KEM/T350M476K035AS	1
006	C127,C128,C131,C132 C134,C149,C150,C151	CB1074-00	CAP,ALUM 470UF 20% 35WV SPR/515D477M035CGGA	8
007	C175	CB2204-00	CAP,MICA D10 5PF +/-.5PF 500WV COD/CD10CD050D03	1

REPLACEMENT PARTS LIST

BRD,CNTL PNL PROCESSOR
ASSEMBLY NUMBER: 064710-00 ISSUE: M ECN: Z208

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
008	C176,C183,C184	CB2205-00	CAP,MICA D10 10PF 5% 500WV COD/CD10CD100J03	3
090	C177	CB2231-00	CAP,MICA D10 150PF 5% 500WV COD/CD10FD151J03	1
091	C119	CB2252-00	CAP,MICA D10 1000PF 5% 100WV COD/D101F102J03	1
009	C120,C143	CB4007-00	CAP,TANT 3.3UF 20% 15WV GVG/A70-CB4007-00 A1	2
010	C101,C102,C103,C104 C105,C106,C107,C108 C179.C180,C181,C182	CB4019-00	CAP,TANT 6.8UF 10% 15WV GVG/A70-CB4019-00 A2	12
011	C178,C193,C195,C196 C197	CB4022-00	CAP,TANT 22UF 10% 15WV GVG/A70-CB4022-00 A1	5
092	C123,C157,C163	CB4034-00	CAP,TANT 22UF 20% 16WV .1 SP GVG/A70-CB4034-00 A2	3
093	C158,C160	CB4041-00	CAP,TANT 150UF 10% 16WV GVG/A70-CB4041-00 A2	2
094	J1	CF0626-00	CONN,PL 6POS 1ROW PCB MNT AMP/207378-1	1
016	J8	CF1171-00	CONN,PL HDR 50POS 2ROW PCB MNT AMP/2-102973-5	1
095	J7	CF1206-00	CONN,PL HDR 20POS 2ROW PCB MNT AMP/1-87227-0	1
017	J5	CF1279-00	CONN,PL HDR 34POS 2ROW PCB MNT AMP/1-87227-7	1
140	J4	CF1344-00	CONN,PL HDR 4POS 1ROW PCB MNT AMP/102972-4	1
143	J6	CF1424-00	CONN,PL HDR 12POS 2ROW PCB MNT AMP/102973-6	1
083	J2	CF1708-00	CONN,PL 25POS 2ROW D SUB PCB MNT AMP/747238-4	1
013	J3	CF1815-00	CONN,PL 15POS 2ROW PCB MNT AMP/747236-4	1
018	Y2	CJ2025-00	CRYSTAL,24MHZ CTK/MP240	1
019	Y1	CJ2043-00	CRYSTAL,3.6864MHZ HC-18U GVG/A70-CJ2043-00 A2	1
020	Y3	CJ2047-00	CRYSTAL,10MHZ 14 DIP CTK/MXO-55 GA-2C 10.000MHZ	1
070	Q15,D2,D6	HB2036-00	HEAT SINK,TO-220 WSHR W/THRM FLM GVG/A70-HB2036-00 A1	3
071	Q15,D2,D6,Q7, Q14	HB2038-00	HEAT SINK,TO-220 INSUL WSHR GVG/A70-HB2038-00 A1	5
072	HS3	HB2043-00	HEAT SINK,TO-220 50DEG RISE@5W .38H AAV/5072B	1
096	HS1,HS2	HB2065-00	HEAT SINK,ALL TRANS BLK ANDZ 25C/3W GVG/A70-HB2065-00 A1	2
148	Q7,Q14	HB2070-00	HEAT SINK,TO-218 INSUL GVG/A70-HB2070-00 A1	2
145	J6	JA1009-00	JACK,SHTG BLK PLSTC 2 CNT	6

REPLACEMENT PARTS LIST

BRD,CNTL PNL PROCESSOR
ASSEMBLY NUMBER: 064710-00 ISSUE: M ECN: Z208

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			AMP/530153-2	
146	2 EA SB2050-00 2 EA SB6040-00 1 EA SC0140-01 2 EA CF1815-00	NA4002-00	NUT #4-40 1/16x3/16 H NUT,4-40,.0625X.1875,HEX,ZINC PL	7
022	K2	RA7031-01	RLY,DPDT 5V 125 OHM UL/CSA 2 FORM C ARO/DS-2E-S-DC5V	1
098	R2,R3,R5,R10,R17,R23 R24,R27,R29,R31,R32 R43,R44,R48,R50,R51 R52,R53	RB2102-00	RES,1K OHM 2% 1/4W MTL FLM GVG/A70-RB2102-00 A1	18
025	R20,R22,R39 R40,R100,R102	RB2103-00	RES,10K OHM 2% 1/4W MTL FLM GVG/A70-RB2103-00 A1	6
099	R1,R4,R33,R41	RB2104-00	RES,100K OHM 2% 1/4W MTL FLM GVG/A70-RB2104-00 A1	4
026	R90,R91,R92,R93,R94	RB2181-00	RES,180 OHM 2% 1/4W MTL FLM GVG/A70-RB2181-00 A1	5
027	R80,R81,R83,R86	RB2222-00	RES,2.2K OHM 2% 1/4W MTL FLM GVG/A70-RB2222-00 A1	4
028	R98,R101	RB2223-00	RES,22K OHM 2% 1/4W MTL FLM GVG/A70-RB2223-00 A1	2
101	R99	RB2240-00	RES,24 OHM 2% 1/4W MTL FLM GVG/A70-RB2240-00 A1	1
103	R11	RB2332-00	RES,3.3K OHM 2% 1/4W MTL FLM GVG/A70-RB2232-00 A1	1
151	R21,R30	RB2391-00	RES,390 OHM 2% 1/4W MTL FLM GVG/A70-RB2391-00 A1	2
104	R26,R49	RB2430-00	RES,43 OHM 2% 1/4W MTL FLM GVG/A70-RB2430-00 A1	2
029	R84,R85	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	2
105	R19,R34	RB2472-00	RES,4.7K OHM 2% 1/4W MTL FLM GVG/A70-RB2472-00 A1	2
106	R25,R42	RB2511-00	RES,510 OHM 2% 1/4W MTL FLM GVG/A70-RB2511-00 A1	2
032	R79,R82,R95,	RB2560-00	RES,56 OHM 2% 1/4W MTL FLM GVG/A70-RB2560-00 A1	3
033	R77	RB2561-00	RES,560 OHM 2% 1/4W MTL FLM GVG/A70-RB2561-00 A1	1
034	R78	RB2562-00	RES,5.6K OHM 2% 1/4W MTL FLM GVG/A70-RB2562-00 A1	1
107	R96,R97	RB2681-00	RES,680 OHM 2% 1/4W MTL FLM GVG/A70-RB2681-00 A1	2
139	R76	RB7270-00	RES,27 OHM 10% 1W CAR COMP AB/GB2701	1
035	RN15,RN16	RN0042-00	RES NTWK,22K OHM 9 RES 10 SIP AB/710A223	2
036	RN10,RN3	RN0044-00	RES NTWK,4.7K OHM 9 RES 10 SIP AB/710A472	2
037	RN1	RN0074-00	RES NTWK,10K OHM 8 RES 16 DIP	1

REPLACEMENT PARTS LIST

BRD,CNTL PNL PROCESSOR
ASSEMBLY NUMBER: 064710-00 ISSUE: M ECN: Z208

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			AB/316B103	
038	RN2,RN5,RN6,RN7,RN9 RN12,RN13,RN14	RN0081-00	RES NTWK,10K OHM 9 RES 10 SIP AB/710A103	8
039	RN17,RN21,RN22	RN0115-00	RES NTWK,330 OHM 8 RES 16 DIP BOR/4116R-001-331	3
108	RN8,RN18,RN19,RN20	RN0171-00	RES NTWK,100 OHM 16 DIP BOR/4116R-001-101	4
109	R9	RU0010-00	RES,30 OHM 5% 5W WW GVG/A70-RU0010-00 A1	1
110	R15,R16	RV1001-00	RES,1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1K 1%	2
111	R36	RV1021-00	RES,1.02K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.02K 1%	1
112	R37	RV1022-00	RES,10.2K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 10.2K 1%	1
102	R12	RV1152-00	RES,11.5K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 11.5K 1%	1
113	R6	RV1211-00	RES,1.21K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.21K 1%	1
114	R7	RV1212-00	RES,12.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 12.1K 1%	1
115	R45	RV1302-00	RES,13K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 13K 1%	1
150	R13	RV1502-00	RES,15K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 15K 1%	1
116	R18	RV1912-00	RES,19.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 19.1K 1%	1
117	R38	RV2211-00	RES,2.21K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 2.21K 1%	1
118	R8	RV3162-00	RES,31.6K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 31.6K 1%	1
119	R14,R46	RV4750-00	RES,475 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 475 OHM 1%	2
120	R35	RV5231-00	RES,5.23K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 5.23K 1%	1
121	R47	RV6341-00	RES,6.34K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 6.34K 1%	1
149	2 EA FOR CF1815-00	SA1054-01	SCRW,MACH 4-40X.3125L PH PNH W/NYL	2
147	2 EA SB2050-00 2 EA SB6040-00 1 EA SC0140-01	SA1262-01	SCRW,MACH 4-40X.375L PH PNH W/NYL FFT/MACH 4-40X.37L PH PNH SST W/NYL	5
041	DS1,DS2,DS3,DS4,DS5 DS6,DS7,DS8,DS9,DS10 DS11,DS12,DS13	SB1018-00	DIODE,LED MV5453 GRN WIDE-BEAM GI/MV5453	13
042	D2,D6,D16	SB2050-00	DIODE,RECT MBR1635 TO-220AC 35V@16A GVG/A70-SB2050-00 A1	3
043	D3,D4,D10,D13,D15, D17	SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	6
122	D1,D5	SB4035-00	DIODE,ZENER 1N5341A 6.2V@200MA	2

REPLACEMENT PARTS LIST

BRD,CNTL PNL PROCESSOR
ASSEMBLY NUMBER: 064710-00 ISSUE: M ECN: Z208

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			GVG/A70-SB4035-00 A1	
123	Q7,Q14	SB6040-00	TRANS,PMOSFET MTH20P08 TO-218AC GVG/A70-SB6040-00 A1	2
124	Q3,Q4,Q9,Q10	SB8003-00	TRANS,NPN 2N4124 TO-92 SM-SIG GVG/A70-SB8003-00 A1	4
125	Q2,Q6,Q8,Q13	SB8006-00	TRANS,NPN 2N4401 TO-92 SM-SIG GVG/A70-SB8006-00 A1	4
126	Q5,Q12	SB8007-00	TRANS,PNP 2N4403 TO-92 SM-SIG GVG/A70-SB8007-00 A1	2
045	U42	SC0035-00	IC,TTL 7417 14 DIP 7417	1
046	Q15	SC0140-01	IC,LIN LM340T-12 TO-220AB GVG/A70-SC0140-01 A1	1
127	Q1,Q11	SC0195-00	IC,LIN MC78L12 TO-92 GVG/A70-SC0195-00 A1	2
128	U1,U3	SC0352-00	IC,LIN LF351N 8 DIP GVG/A70-SC0352-00 A2	2
129	U38	SC0955-00	IC,MEM X2864AP-25 28 DIP 250NSEC AMD/AM2864AE-255DC	1
050	U7	SC0977-00	IC,TTL MAX232CPE 16 DIP GVG/A70-SC0977-00 A1	1
135	U12,U13	SC1019-00	IC,LIN DS8921N 8 DIP GVG/A70-SC1019-00 A1	2
051	U2,U4	SC1102-00	IC,LIN SG3525AN 16 DIP GVG/A70-SC1102-00 A1	2
138	U39 054177-00	SC1246-00	IC,PAL GAL16V8A-25PL 20 DIP AMD/PALCE16V8H-25PC/4	1
052	U34,U35,U36,U37,U48 U49,U50,U51	SC1280-00	IC,MEM CDM62256E10 28 DIP GVG/A70-SC1280-00 A3	8
130	U16	SC1311-00	IC,ACMOS 74ACT374PC 20 DIP GVG/A70-SC1311-00 A2	1
131	U25	SC1360-00	IC,HCMOS 74HC259N 16 DIP MOT/MC74HC259N	1
132	U24	SC1450-00	IC,ACMOS 74ACT02 14 DIP HAR/CD74ACT02E	1
053	U21	SC1501-00	IC,UP MC68450RC10 68 PGA GVG/A70-SC1501-00 A1	1
054	U17,U23	SC1537-00	IC,ACMOS 74ACT373PC 20 DIP GVG/A70-SC1537-00 A2	2
055	U20,U43	SC1622-00	IC,ACMOS 74ACT04E 14 DIP HAR/CD74ACT04E	2
056	U52,U55	SC1624-00	IC,ACMOS 74ACT244PC 20 DIP NSC/74ACT244PC	2
133	U33 054193-01 U47 054192-01	SC1636-00	IC,MEM AM27C512-175DC 28 DIP AMD/AM27C512-175DC	2
057	U18,U22,U53,U54	SC1641-00	IC,ACMOS 74ACT245PC 20 DIP NSC/74ACT245PC	4
059	U8 054178-00	SC1683-00	IC,MEM XC1736 8 DIP GVG/A70-SC1683-00 A2	1
061	U10	SC1685-00	IC,I/F DP8473V 52 PLCC	1

REPLACEMENT PARTS LIST

BRD,CNTL PNL PROCESSOR
ASSEMBLY NUMBER: 064710-00 ISSUE: M ECN: Z208

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			GVG/A70-SC1685-00 A1	
062	U15	SC1687-00	IC,UP MC68010FN10 68 PLCC GVG/A70-SC1687-00 A1	1
063	U5	SC1688-00	IC,UP MC68681FN 44 PLCC GVG/A70-SC1688-00 A1	1
066	U19	SC1691-00	IC,ACMOS 74AC10 14 DIP NSC/74AC10PC	1
067	U9,U40,U41	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	3
134	U26	SC1712-00	IC,ACMOS 74ACT00 14 DIP GVG/A70-SC1712-00 A2	1
060	U32,U46 U31,U45	SC1826-00	IC,MEM P28F512-200 32 DIP GVG/A70-SC1826-00 A1	4
144	U6	SC1827-00	IC,UP SCB68155CA44 44 PLCC GVG/A70-SC1827-00 A1	1
065	U11	SC1872-00	IC,EPLD XC2018-70PC68C 68 PLCC XIL/XC2018-70PC68C	1
074	U19,U20,U24,U26,U42, U43	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	6
075	U2,U4,U7,U9,U25,U40, U41	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	7
073	U1,U3,U8,U12,U13,	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	5
076	U16,U17,U18,U22,U23, U39,U52,U53,U54,U55,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	10
077	U33,U34,U35,U36,U37, U38,U47,U48,U49,U50, U51,	SE8035-05	SKT,IC 28 DIP.6 CB BLK STR LEG AMP/2-640362-3	11
079	U5,U6	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK AMP/3-821688-1	2
082	U21	SE8052-00	SKT,IC 68 PGA 10X10 LIF AMP/55270-3	1
181	ECO# Z333 U11,U15,	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK AMP/3-821689-3	2
081	U11,U15	SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY BUR/QILE68P-410T	2
078	U31,U32,U45,U46,	SE8074-00	SKT,IC 32 DIP .6 CB BLK AMP/2-644018-3	4
080	U10	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	1
021	S1 (CK8121)	SJ0074-00	SW,PB SPDT MOM PCB MTG CKC/8121-S-D9-A-G-E	1
152	2 EA FOR CF1815-00	TA6003-00	LUG SLDR,#4 LCK .6406L BRS/HOT TIN GVG/A70-TA6003-00 A1	2
136	TP1,TP2,TP3,TP4,TP5 TP6,TP7,TP8,TP9,TP10 TP11,TP12,TP13,TP14 TP15,TP20,TP21,TP25 TP26,TP27,TP28,TP29	TA6059-00	TUR PN,.06X.1406 POST .0625 PCB GVG/A70-TA6059-00 A1	22
069	L1,L2,L4,L5,L6,L7,L9	ZB4122-00	INDCTR,20UH HIGH CURRENT	7

REPLACEMENT PARTS LIST

BRD,CNTL PNL PROCESSOR
ASSEMBLY NUMBER: 064710-00 ISSUE: M ECN: Z208

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			GOW/50-235	
141	L8	ZB4136-00	INDCTR,PWR 220UH @ 5A GVG/A70-ZB4136-00 A1	1
142	L3	ZB4138-00	INDCTR,PWR 100UH +/-5% @10A ATN/C-1557	1
137	FB1	ZB4211-00	INDCTR,FERRITE BEAD WIRED 34 OHMS FER/11413-3B	1

REPLACEMENT PARTS LIST

BRD,DISPLAY & EMEM
ASSEMBLY NUMBER: 064711-00 ISSUE: H ECN: W679

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,B07/08	000000-00	REFERENCE DOCUMENTS	0
101		044711-01	PCB,DISPLAY AND EMEM	1
001	C2,C3,C5	CB0319-00	CAP,CER .1UF 20% 50WV Z5U .2 SP AVX/SR215E104MAA	3
110	C1,C6 (PUMP HANDLE)	CB4019-00	CAP,TANT 6.8UF 10% 15WV GVG/A70-CB4019-00 A2	2
002	C4	CB4022-00	CAP,TANT 22UF 10% 15WV GVG/A70-CB4022-00 A1	1
003	J1	CF1178-00	CONN,PL HDR 26POS 2ROW PCB MNT AMP/1-102973-3	1
016	R11	PD0114-00	POT,DUAL 5K/5K 20% 360 DEG ROT CLA/PD0114-00	1
005	DS1,DS2	RA4024-00	RDOUT DSPL,LED DUAL .3 HGT RED GI/MAN74A	2
006	R1,R2,R3,R4,R5,R6,R7 R8,R9,R10,R12,R13 R14,	RB2473-00	RES,47K OHM 2% 1/4W MTL FLM GVG/A70-RB2473-00 A1	13
007	RN1,RN2	RN0115-00	RES NTWK,330 OHM 8 RES 16 DIP BOR/4116R-001-331	2
008	D1,D2,D3,D4,D5,D6,D7 D8,D9,D10,D11,D12 D13,D14,D15,D16,D17 D18,D19	SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	19
009	U3,U4	SC1311-00	IC,ACMOS 74ACT374PC 20 DIP GVG/A70-SC1311-00 A2	2
010	U5	SC1609-00	IC,ACMOS 74AC139 16 DIP GVG/A70-SC1609-00 A2	1
014	U1,U2	SC1733-00	IC,I/F DP8310N 20 DIP GVG/A70-SC1733-00 A1	2
012	U5	SE8011-00	SKT,IC 16 DIP .3 CB BLK AMP/2-641262-3	1
011	U1,U2,U3,U4	SE8034-00	SKT,IC 20 DIP .3 CB BLK AMP/2-641264-3	4
018	DS1,DS2	SE8178-00	SKT,IC 16 DIP .2 WW ELEVATOR ARI/1108264	2
015	S1,S2,S3,S4,S5,S6, S7,S8,S9,S10,S11, S12,S13,S14,S15,S16, S17,S18,S19, ECO# Z209	SJ0230-01	SW,LT PB MOM SPST ISD/603073	19
017	ECO# Z209 S1,S2,S3,S4,S5,S6, S7,S8,S9,S10,S11, S12,S13,S14,S15,S16, S17,S18,S19,	SJ0230-02	SW,LT PB MOM SPST ISD/603216	19

REPLACEMENT PARTS LIST

BRD,EXTENDER ANLG INTERFACE
ASSEMBLY NUMBER: 064713-00 ISSUE: B ECN: Z008

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001		044713-00	PCB,EXTENDER ANALOG	1
004	J2,J3 (TO M/BD.)	CF1039-00	CONN,PL 96POS 3ROW RTANG PAN ONLY GVG/A70-CF1039-00 A1	2
002	J5,J6 (TO MODULE)	CF1814-00	CONN,RCPT 96POS 3ROW RTANG PCB MNT GVG/A70-CF1814-00 A2	2
005	J1 KEYED TO MOTHER BOARD.	CF1883-00	CONN,PL 96POS 3ROW RTANG PCB 5KEYED PAN/100-096-2007	1
003	J4 KEYED TO AIF BOARDS.	CF1884-00	CONN,RCPT 96POS 3ROW RTANG PCB 5KEY PAN/100-096-2009	1
006	RN1,RN2,RN3,RN4,RN5, RN6,RN7,RN8	RN0143-00	RES NTWK,47 OHM 8 RES 16 DIP BEK/898-3-R47	8

<< GVG - PSD >>

REPLACEMENT PARTS LIST

BRD,DPM100 INT MTHBD
ASSEMBLY NUMBER: 064716-01 ISSUE: A ECN: Z391

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D45	000000-00	REFERENCE DOCUMENTS	0
001		044716-01	PCB,DPM100 INTERIOR MTHRBD	1
004	J1	CF1087-00	CONN,RCPT HDR 24POS 4ROW PCB W/EARS AMP/206763-3	1
003	J3,J4,J5,J7,J8, J10,J11,J13,	CF1812-00	CONN,RCPT 96POS 3ROW PCB MNT GVG/A70-CF1812-00 A1	8
002	J2,J6,J9,J12: KEYED	CF1882-00	CONN,RCPT 96POS 3ROW PCB MNT 5KEYS PAN/135-096-2008	4
005	RN1,RN2,RN3,RN4,RN5, RN6,	RN0182-00	RES NTWK,110 OHM 4 RES 8 SIP BOR/4608X-102-111	6

REPLACEMENT PARTS LIST

BRD,DPM100 EXT MTHBD
ASSEMBLY NUMBER: 064717-01 ISSUE: B ECN: Z427

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D45,C06,	000000-00	REFERENCE DOCUMENTS	0
001		044717-00	PCB,DPM100 EXTERIOR MOTHERBOARD	1
002	FB12,FB13,FB14,FB15, FB15A,FB16,FB16A, FB16B,FB16C,FB17, FB17A,FB17B,FB17C, FB18,FB18AB, FB19,FB19AB, FB19CD,FB19EF, FB20AB,FB20CD, FB20EF,FB21AB, FB21CD,FB21EF, FB22AB,FB22CD, FB22EF,FB23AB, FB23CD,FB23EF, FB28,FB29,FB30,	054720-00	FLTR,EMI COMMON MODE,FERRITE BEAD PWS/PSC-5043	34
003	C1	CB2244-00	CAP,MICA D10 470PF 5% 100WV COD/D101F471JO	1
004	J15,J16A,J16B,J16C, J17A,J17B,J17C,J18A, J18B,J19A,J19B,J19C, J19D,J19E,J19F,J20A, J20B,J20C,J20D,J20E, J20F,J21A,J21B,J21C, J21D,J21E,J21F,J22A, J22B,J22C,J22D,J22E, J22F,J23A,J23B,J23C, J23D,J23E,J23F,	CF0430-00	CONN,JACK BNC PRS FIT W/SLDR TERM AMP/222006-1	39
020	J2	CF1929-00	CONN,RCPT 15POS 2ROW W/EMI FLTR AMP/842615-6	1
008	J1,J4,	CF1930-00	CONN,RCPT 25POS 2ROW W/EMI FLTR AMP/842616-6	2
024	J3,J5,J6,J7,	CF2093-00	CONN,RCPT 9POS 2ROW PCB MNT AMP/1-747150-1	4
025	J9,J10,J11,J12, J13,J14,	CF2094-00	CONN,RCPT 25POS 2ROW PCB MNT AMP/1-745967-1	6
023	U1,U2,U3,U4,U5,U6, U7,U8,U9,U10,U11, U12,U13,U14,U15,U16, U17,U18,	FA6057-00	FLTR,EMI COMMON MODE 16 DIP FRS/94-010-1	18
017		SA1263-01	SCRW,MACH 4-40X.312L PH PNH W/NYL FFT/MACH 4-40X.31L PH PNH SST W/NYL	26
026		SF2194-00	SPCR,#4 .187 HEX .140L SST FFT/#4 .187 HEX .140L SST	20
027		SH2154-00	STDF,FEM 4-40 .187 HEX .343L SST FFT/FEM 4-40 .187 HEX .343L SST	6
028		SH2156-00	STDF,M/F 4-40 .187 HEX .187L W/NYL FFT/4-40 .187 HEX .187L SST W/NYL	26

REPLACEMENT PARTS LIST

BRD,DPM100 EXT MTHBD
ASSEMBLY NUMBER: 064717-01 ISSUE: B ECN: Z427

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
011	L18A,L18B,L19A,L19B, L19C,L19D,L19E,L19F,	ZB4001-01	INDCTR,MINI .10UH 5% GOW/10M100J	8
012	L20A,L20B,L20C,L20D, L20E,L20F,L21A,L21B, L21C,L21D,L21E,L21F,	ZB4005-01	INDCTR,MINI .22UH 5% GOW/10M220J	12
013	L22A,L22B,L22C,L22D, L22E,L22F,L23A,L23B, L23C,L23D,L23E,L23F,	ZB4006-01	INDCTR,MINI .27UH 5% GOW/10M270J	12
014	FB20,FB21,FB22,FB23, FB24,FB25,FB27,	ZB4234-00	INDCTR,FERRITE BEAD EMI FILTER FPC/2743003111	7

REPLACEMENT PARTS LIST

BRD,PAL ANALOG INTERFACE
ASSEMBLY NUMBER: 064722-00 ISSUE: K ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D07/08	000000-00	REFERENCE DOCUMENTS	0
228		024700-00	BAR,MODULE SUPPORT	1
229		024701-00	STIFFENER,PC BOARD FRONT DPM-100	1
002		044722-01	PCB,PAL COMPOSITE VIDEO PROCESSOR	1
241	FB500,FB501,FB502, FB503,FB504,FB505, FB506,FB507,FB508, FB509,FB510,FB700, FB701,FB702,FB703, FB704,FB705,FB706,	054721-00	FLTR,EMI,FERRITE BEAD PSC/PSC-5047	18
001	10.5 INCH (F8) 4 INCH (F16,F17) 5 INCH (F11,F101) 3 INCH (F160) 2 INCH (F1,F2,F3,F4, F5,F400,F401)	BC7001-00	BUS STP,24.0L 1 SP 24 PIN BEI/B13903-0T	46
261	C112	CB0118-00	CAP,CER .1UF 10% 50WV X7R .2SP AVX/SR215C104KAA	1
015	C528	CB0119-00	CAP,CER .22UF 10% 50WV X7R AVX/SR305C224KAA	1
004	C50,C52,C57,C109, C150,C207,C401,C518, C519,C522,C523,C525, C540,C545,C600,C604, C605,C608,C613,C614, C631,C638,C701,C703, C707,C708,C711,C712, C714,C717,C718,C720, C729,C732,C734,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	35
264	C630	CB0281-00	CAP,CER 2200PF 10% 50WV X7R KEM/C317C222K5R5CA	1
266	C422,C423,	CB0284-00	CAP,CER 4700PF 10% 50WV X7R KEM/C317C472K5R5CA	2
005	C120,C234,C403,C407, C412,C413,C424,	CB0285-00	CAP,CER .047UF 10% 50WV X7R KEM/C322C473K5R5CA	7
006	C303,C305,C418,C426, C542,C622,C625,	CB0286-00	CAP,CER .022UF 10% 50WV X7R KEM/C322C223K5R5CA	7
008	C1,C2,C7,C8, C11,C13,C19,C20, C21,C29,C30,C31, C39,C40,C41,C46, C47,C48,C49,C51, C53,C54,C55,C59, C60,C61,C107,C108, C110,C111,C113, C114,C115,C117,C128,	CB0354-00	CAP,CER .1UF 20% 50WV Z5U AXIAL MUR/RPA10Z5U104M50PT	128

REPLACEMENT PARTS LIST

BRD,PAL ANALOG INTERFACE
ASSEMBLY NUMBER: 064722-00 ISSUE: K ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
008	C134,C145,C146,C148, C200,C201,C206,C210, C211,C212,C215,C216, C217,C218,C221,C232, C241,C242,C244,C249, C254,C301,C308,C409, C410,C414,C415,C427, C444,C502,C504,C505, C506,C511,C512,C514, C516,C517,C520,C521, C526,C527,C530,C531, C532,C534,C535,C536, C537,C538,C539,C541, C546,C549,C601,C603, C606,C607,C609,C610, C611,C612,C615,C616, C617,C618,C619,C620, C623,C624,C627,C628, C632,C635,C636,C637, C639,C700,C702,C709, C710,C713,C719,C722, C723,C725,C726,C727, C728,C730,C731,C733, C735,	CB0354-00	CONTINUED FROM PREVIOUS PAGE MUR/RPA10Z5U104M50PT	
028	C56,C58,C63,C64,C65, C543,C548,C602,C704, C705,C706,C716,C721, C724,C736,C737,	CB0366-00	CAP,CER 330PF 10% 200WV X7R KEM/C315C331K2R5CA	16
009	C300,C307	CB1095-00	CAP,ALUM 330UF 20% 50WV GVG/A70-CB1095-00 A1	2
010	C14	CB2201-00	CAP,MICA D10 1PF +/-.5PF 500WV COD/CD10CD010D03	1
011	C24,C35,C44,C121, C124,C225,C229,	CB2203-00	CAP,MICA D10 3PF +/-.5PF 500WV COD/CD10CD030D03	7
013	C36,C62,C129,C236,	CB2205-00	CAP,MICA D10 10PF 5% 500WV COD/CD10CD100J03	4
252	C137,C247	CB2207-00	CAP,MICA D10 15PF 5% 500WV COD/CD10CD150J03	2
200	C103	CB2209-00	CAP,MICA D10 20PF 5% 500WV COD/CD10ED200J03	1
017	C102,C133,C213,C240, C406,C503,C507,	CB2211-02	CAP,MICA D10 24PF +/-.5PF 500WV COD/CD10ED240D03	7
317	ECO# Z370 C102,C103,C133,C213, C240,C406,C503,C507,	CB2211-02	CAP,MICA D10 24PF +/-.5PF 500WV COD/CD10ED240D03	8
018	C421,C501,C510,	CB2212-01	CAP,MICA D10 27PF +/-1PF 500WV COD/CD10ED270C03	3
020	C118,C140,C203,C251,	CB2213-01	CAP,MICA D10 30PF +/-1PF 500WV COD/CD10ED300C03	4
021	C214,C524,	CB2214-01	CAP,MICA D10 33PF +/-1PF 500WV	2

REPLACEMENT PARTS LIST

BRD,PAL ANALOG INTERFACE
ASSEMBLY NUMBER: 064722-00 ISSUE: K ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			COD/CD10ED330C03	
318	ECO# Z370 C101,C402	CB2216-00	CAP,MICA D10 39PF 5% 500WV COD/CD10ED390J03	2
022	C402	CB2216-01	CAP,MICA D10 39PF +/-1PF 500WV COD/CD10ED390C03	1
024	C101,C220,C501,C510,	CB2218-01	CAP,MICA D10 47PF 2% 500WV COD/CD10ED470G03	4
319	ECO# Z370 C100,C220,C501,C510,	CB2218-01	CAP,MICA D10 47PF 2% 500WV COD/CD10ED470G03	4
025	C500,C509	CB2219-00	CAP,MICA D10 50PF 5% 500WV COD/CD10ED500J03	2
027	C100,C119,C135,C202, C245,C417,	CB2221-01	CAP,MICA D10 56PF 1% 500WV COD/CD10ED560F03	6
320	ECO# Z370 C119,C135,C202,C245, C417,	CB2221-01	CAP,MICA D10 56PF 1% 500WV COD/CD10ED560F03	5
029	C420,C515,	CB2223-01	CAP,MICA D10 68PF 1% 500WV COD/CD10ED680F03	2
031	C142,C253,C404,	CB2225-01	CAP,MICA D10 82PF 1% 500WV COD/CD10ED820F03	3
034	C125,C219,C224,C228, C230,C419,	CB2227-01	CAP,MICA D10 100PF 1% 500WV COD/CD10FD101F03	6
138	C122,C226,	CB2228-00	CAP,MICA D10 110PF 5% 500WV COD/CD10FD111J03	2
253	C138,C250,C428	CB2232-01	CAP,MICA D10 160PF 1% 500WV COD/CD10FD161F03	3
140	C222,	CB2234-01	CAP,MICA D10 200PF 1% 500WV COD/CD10FD201F03	1
037	C408,C416	CB2239-00	CAP,MICA D10 300PF 5% 300WV COD/CD10FC301J03	2
038	C425,C544,C547,C629,	CB2250-00	CAP,MICA D10 820PF 5% 100WV COD/D101F821JO3	4
039	C405	CB2252-00	CAP,MICA D10 1000PF 5% 100WV COD/D101F102JO3	1
040	C9,C400,C508,	CB2255-00	CAP,MICA D10 4PF +/-.5PF 500WV COD/CD10CD040D03	3
321	ECO# Z370 C400,C508,	CB2255-00	CAP,MICA D10 4PF +/-.5PF 500WV COD/CD10CD040D03	2
041	C116,C204,	CB2256-00	CAP,MICA D10 6PF +/-.5PF 500WV COD/CD10CD060D03	2
268	C22,C28,C34,	CB2257-00	CAP,MICA D10 7PF +/-.5PF 500WV COD/CD10CD070D03	3
267	C12,C43,	CB2258-00	CAP,MICA D10 8PF +/-.5PF 500WV COD/CD10CD080D03	2
043	C23,C33,C42,	CB2265-01	CAP,MICA D10 75PF 1% 500WV COD/CD10ED750F03	3
044	C25,C32,C45,	CB2266-01	CAP,MICA D10 130PF 1% 500WV COD/CD10FD131F03	3
048	C429	CB2270-00	CAP,MICA D10 560PF 5% 100WV COD/D101F561J0	1

REPLACEMENT PARTS LIST

BRD,PAL ANALOG INTERFACE
ASSEMBLY NUMBER: 064722-00 ISSUE: K ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
019	C621	CB3088-00	CAP,FILM .1UF 5% 100WV GVG/A70-CB3088-00 A1	1
045	C106,	CB4006-00	CAP,TANT 1UF 20% 35WV GVG/A70-CB4006-00 A1	1
046	C3,C4,C5,C6, C15,C16,C17,C18, C26,C27,C37,C38, C104,C105,C130,C131, C141,C143,C144,C147, C149,C205,C208,C209, C223,C235,C237,C238, C243,C248,C302,C304, C306,C371,C411,C529, C533,C626,C715,	CB4036-00	CAP,TANT 5.6UF 10% 20WV GVG/A70-CB4036-00 A1	39
047	C10,C136,C231,	CB5001-00	CAP,VAR 2.5-9PF 100WV TOP GVG/A70-CB5001-00 A4	3
049	EJ1,EJ2,	CC2073-00	CARD EJCTR,NYL BLK .062 THK PCB CAK/107-20	2
051	J100,J101,J200,J201, J703,J704,J705,J706, J707,J708,	CF0676-03	CONN,PL HDR 3POS 1ROW PCB MNT 3M/929647-01-03-30	10
053	J2,J3	CF1039-00	CONN,PL 96POS 3ROW RTANG PAN ONLY GVG/A70-CF1039-00 A1	2
052	J4,J5,J701,J702,	CF1206-00	CONN,PL HDR 20POS 2ROW PCB MNT AMP/1-87227-0	4
054	J6,J8:CUT PIN 53 J7,J9:CUT PIN 3	CF1720-00	CONN,PL HDR 56POS 2ROW VERT PCB MNT AMP/2-103186-8	4
227	J1	CF1883-00	CONN,PL 96POS 3ROW RTANG PCB 5KEYED PAN/100-096-2007	1
055	Y501,	CJ2088-00	CRYSTAL,17.734475MHZ HC-49U GVG/B70-CJ2088-00	1
056	DL400	FA6003-00	FLTR,LO PASS 2 SECT BAL/FA6003-00	1
251		HB2036-00	HEAT SINK,TO-220 WSHR W/THRM FLM GVG/A70-HB2036-00 A1	2
057	HS300,HS301,	HB2040-01	HEAT SINK,PLSTC PWR TRAN 1"H W/PINS AAV/60130-010PB	2
058	U3,U5,U7,	HB9003-10	HYBRID,VIDEO OP AMP,4 LOAD DRIVER GVG/HB9003-10	3
059	U2,U106,U108,U110, U211,U212,U213,	HB9032-10	HYBRID,VIDEO BUFFER GVG/HB9032-10	7
060	U1	HB9049-10	HYBRID,EQUALIZING AMP (NPN OUTPUT)	1
061	U4,U6,U8,	HB9061-00	HYBRID,ORION OUTPUT RES NETWORK GVG/HB9061-00	3
062	U103,U104	HB9065-00	HYBRID,SIP MULTIPLIER GVG/HB9065-00	2
063	U204	HB9069-00	HYBRID,2 INPUT NEG NAM GVG/HB9069-00	1
064	U203,U205	HB9069-10	HYBRID,2 INPUT POS NAM	2

REPLACEMENT PARTS LIST

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ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			GVG/HB9069-10	
065	U101	HB9078-00	HYBRID,VIDEO CLAMP GVG/HB9078-00	1
066	U100	HB9081-02	HYBRID,SYNC STRIPPER GVG/HB9081-02	1
067	U206,U207	HB9090-00	HYBRID,PULSE SHAPER GVG/HB9090-00	2
068	U403	HB9099-00	HYBRID,LINEAR V CONT DELAY GVG/HB9099-00	1
069	RN1	HB9118-00	HYBRID,RES NETWORK GVG/HB9118-00	1
070	U102,U105,U214	HB9120-00	HYBRID,SUBCARRIER FILTER GVG/HB9120-00	3
231	S1,S2,S300,S301,	JA1006-00	JACK,SHTG RED PLSTC 2 CNT CAM/450-3775-01-0612	4
250	J101,J201,J705	JA1009-00	JACK,SHTG BLK PLSTC 2 CNT AMP/530153-2	3
247	1 EA SB7006-00 1 EA SB7007-00	NA4002-00	NUT #4-40 1/16x3/16 H NUT,4-40,.0625X.1875,HEX,ZINC PL	2
072	R140,R251,R439,	PD2024-00	POT,TRIM CERMET 5K 10% TOP BOR/3329H-1-502	3
073	R229,R230,R232,R233, R301,R606,	PD2028-00	POT,TRIM CERMET 20K 10% TOP BOR/3329H-1-203	6
074	R114,R115,R116,R145, R206,R219,R261,	PD2033-00	POT,TRIM CERMET 100 10% TOP BOR/3329H-1-101	7
075	R100,R129,R244,	PD2038-00	POT,TRIM CERMET 100K 10% TOP BOR/3329H-1-104	3
076	R147,R263,	PD2058-00	POT,TRIM 50 OHM 10% TOP BOR/3329H-1-500	2
077	R514	RB2100-00	RES,10 OHM 2% 1/4W MTL FLM GVG/A70-RB2100-00 A1	1
079	R426	RB2105-00	RES,1 MEG OHM 2% 1/4W MTL FLM GVG/A70-RB2105-00 A1	1
080	R407,R421,	RB2154-00	RES,150K OHM 2% 1/4W MTL FLM GVG/A70-RB2154-00 A1	2
269	R540	RB2204-00	RES,200K OHM 2% 1/4W MTL FLM GVG/A70-RB2204-00 A1	1
083	R304,R317	RB2220-00	RES,22 OHM 2% 1/4W MTL FLM GVG/A70-RB2220-00 A1	2
084	R718	RB2224-00	RES,220K OHM 2% 1/4W MTL FLM GVG/A70-RB2224-00 A1	1
082	R228	RB2300-00	RES,30 OHM 2% 1/4W MTL FLM GVG/A70-RB2300-00 A1	1
087	R101,R126,R248,R249,	RB2334-00	RES,330K OHM 2% 1/4W MTL FLM GVG/A70-RB2334-00 A1	4
085	R429,	RB2394-00	RES,390K OHM 2% 1/4W MTL FLM GVG/A70-RB2394-00 A1	1
086	R537,R613,R620,	RB2473-00	RES,47K OHM 2% 1/4W MTL FLM GVG/A70-RB2473-00 A1	3
116	R107,R522,R720,	RB2623-00	RES,62K OHM 2% 1/4W MTL FLM	3

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ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			GVG/A70-RB2623-00 A1	
089	R300,R327,	RD0005-00	RES,.5 OHM 5% 1/2W CARB FILM GVG/A70-RD0005-00 A1	2
090	RN6,RN7,RN8,	RN0059-00	RES NTWK,47K OHM 9 RES 10 SIP AB/710A473	3
091	RN2,RN3,RN4,RN5,	RN0081-00	RES NTWK,10K OHM 9 RES 10 SIP AB/710A103	4
081	RN9,RN10,RN11, RN100,RN101,RN102, RN103	RN0143-00	RES NTWK,47 OHM 8 RES 16 DIP BEK/898-3-R47	7
092	RN700,RN701,RN702, RN703,RN704,	RN0182-00	RES NTWK,110 OHM 4 RES 8 SIP BOR/4608X-102-111	5
093	R108,R109,R201,R205, R302,R324,R708,R711, R20,R21,R22,	RV1000-00	RES,100 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 100 OHM 1%	11
094	R102,R122,R127,R141, R142,R148,R245,R246, R259,R264,R265,R307, R318,R325,R326,R402, R403,R405,R406,R410, R411,R412,R413,R417, R420,R422,R423,R531, R701,R704,R709,R710, R543	RV1001-00	RES,1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1K 1%	33
095	R105,R133,R134,R222, R226,R227,R257,R258, R306,R308,R309,R313, R322,R519,R520,R523, R524,R541,R608,R609, R610,R618,R715,R716, R724,R725,R736,R737,	RV1002-00	RES,10K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 10K 1%	28
096	R316,R319	RV1002-03	RES,10K OHM .1% 1/8W MTL FLM DAL/CMF-55 T-2 10K .1%	2
097	R220,R419,R425,R430, R516,R612,R615,R616,	RV1003-00	RES,100K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 100K 1%	8
099	R311,R545,	RV1101-00	RES,1.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.1K 1%	2
134	R225	RV1151-00	RES,1.15K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.15K 1%	1
107	R5,R6,R7,	RV1210-00	RES,121 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 121 OHM 1%	3
100	R506	RV1211-00	RES,1.21K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.21K 1%	1
101	R437	RV1212-00	RES,12.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 12.1K 1%	1
102	R111,R203	RV1240-00	RES,124 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 124 OHM 1%	2
129	R310	RV1303-00	RES,130K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 130K 1%	1
103	R143,R262,R312,	RV1331-00	RES,1.33K OHM 1% 1/8W MTL FLM	3

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			DAL/CMF-55 T-1 1.33K 1%	
263	R253	RV1431-00	RES,1.43K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.43K 1%	1
104	R212,R218	RV1433-00	RES,143K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 143K 1%	2
105	R110,R112,R121,R125, R136,R200,R204,R236, R241,R252,	RV1501-00	RES,1.5K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.5K 1%	10
270	R542,R544,	RV1502-00	RES,15K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 15K 1%	2
106	R208	RV1740-00	RES,174 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 174 OHM 1%	1
108	R210,R211	RV1821-00	RES,1.82K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 1.82K 1%	2
088	R321	RV2000-00	RES,200 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 200 OHM 1%	1
109	R144,R256,R401,	RV2001-00	RES,2K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 2K 1%	3
110	R224,R315,R535	RV2002-00	RES,20K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 20K 1%	3
111	R104,R303,R314,R323, R428,R722,	RV2210-00	RES,221 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 221 OHM 1%	6
112	R416,R508,R509,R611,	RV2211-00	RES,2.21K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 2.21K 1%	4
113	R409,R414,R418,R442, R443,R719,	RV2212-00	RES,22.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 22.1K 1%	6
223	R532,R607	RV2213-00	RES,221K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 221K 1%	2
115	R500,R511	RV2490-00	RES,249 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 249 OHM 1%	2
133	R433	RV2672-00	RES,26.7K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 26.7K 1%	1
117	R408	RV2742-00	RES,27.4K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 27.4K 1%	1
118	R117,R123,R124,R128, R130,R132,R234,R237, R238,R240,R247,R250,	RV3010-03	RES,301 OHM .1% 1/8W MTL FLM DAL/CMF-55 T-2 301 OHM .1%	12
119	R605,	RV3012-00	RES,30.1K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 30.1K 1%	1
120	R2,	RV3320-00	RES,332 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 332 OHM 1%	1
121	R106,R213,R214,R436, R438,R510,	RV3321-03	RES,3.32K OHM .1% 1/8W MTL FILM DAL/CMF-55 T-2 3.32K .1%	6
122	R202,R305,R526	RV3322-00	RES,33.2K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 33.2K 1%	3
123	R503,R505,R602,R603, R604,	RV3920-00	RES,392 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 392 OHM 1%	5
124	R424,R432,R525,R528, R529,	RV3921-00	RES,3.92K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 3.92K 1%	5
265	R614	RV3923-00	RES,392K OHM 1% 1/8W MTL FLM	1

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			DAL/CMF-55 T-1 392K 1%	
128	R501,R507,R512,R513,	RV4751-00	RES,4.75K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 4.75K 1%	4
224	R533	RV4753-00	RES,475K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 475K 1%	1
130	R1,R4,R207,R400, R404,R415,R431,R441,	RV4990-00	RES,499 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 499 OHM 1%	8
131	R199,R209,R215,R216, R223,R320,	RV4991-00	RES,4.99K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 4.99K 1%	6
132	R103,R231,R239,R243, R517,R518,R521,R527, R617,R619,	RV4992-00	RES,49.9K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 49.9K 1%	10
165	R221	RV5620-00	RES,562 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 562 OHM 1%	1
225	R440	RV5622-00	RES,56.2K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 56.2K 1%	1
135	R137,R427,	RV6810-00	RES,681 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 681 OHM 1%	2
136	R135,R255,R530,	RV6811-00	RES,6.81K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 6.81K 1%	3
256	R139,R260	RV7060-03	RES,706 OHM .1% 1/8W MTL FLM DAL/CMF-55 T-2 706 OHM .1%	2
137	R502,	RV7500-00	RES,750 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 750 OHM 1%	1
226	R515	RV7501-00	RES,7.5K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 7.5K 1%	1
139	R8,R9,R146,R266, R534,R536,R600,R601, R700,R702,R703,R705, R706,R707,R712,R713, R714,R717,	RV7509-00	RES,75 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 75 OHM 1%	18
141	R113,R119,R120,R217,	RV8250-00	RES,825 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 825 OHM 1%	4
260	R3	RV8251-00	RES,8.25K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 8.25K 1%	1
142	R504	RV9091-00	RES,9.09K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 9.09K 1%	1
246	1 EA SB7006-00 1 EA SB7007-00	SA1054-01	SCRW,MACH 4-40X.3125L PH PNH W/NYL	2
230		SA1401-01	SCRW,MACH 2-56X.625 PH PNHD W/NYL FFT/MACH 2-56X.625 PH PNHD SST W/NL	4
143	D1,D2,D200,D201, D202,D203,D204,D205, D206,D207,D208,D300, D301,D302,D303,D502, D503,D507,D508,D600, D601,D602,D603,	SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	23
176	D505,D506	SB4003-00	DIODE,ZENER 1N5231B 5.1V@20MA GVG/A70-SB4003-00 A2	2
144	D504	SB5010-00	DIODE,VARC MV1404 DO-204AA 96-144PF	1

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			GVG/A70-SB5010-00 A1	
145	Q503	SB6008-00	TRANS,NJFET MPF4392 TO-92 GVG/A70-SB6008-00 A1	1
146	Q1,Q2,Q600	SB6018-00	TRANS,FET SD215 TO-72-33 CLG/SD215DEG	3
147	Q300	SB7006-00	TRANS,PNP MJE371 TO-225AA PWR GVG/A70-SB7006-00 A2	1
148	Q304	SB7007-00	TRANS,NPN MJE521 TO-225AA PWR GVG/A70-SB7007-00 A1	1
149	Q301,Q302	SB8003-00	TRANS,NPN 2N4124 TO-92 SM-SIG GVG/A70-SB8003-00 A1	2
150	Q100,Q303,Q400,	SB8004-00	TRANS,PNP 2N4126 TO-92 SM-SIG GVG/A70-SB8004-00 A2	3
151	Q203,Q601,	SB8005-00	TRANS,NPN 2N4265 TO-92 SM-SIG GVG/A70-SB8005-00 A3	2
152	Q202,Q602,	SB8021-00	TRANS,PNP MPS3640 TO-92 SM-SIG GVG/A70-SB8021-00 A2	2
153	Q500,Q502	SB8022-00	TRANS,NPN SPS7348 TO-92 SM-SIG CSC/CEN625	2
154	Q501	SB8023-00	TRANS,PNP MPS6523 TO-92 SM-SIG GVG/A70-SB8023-00 A1	1
155	Q101,Q200,	SB8026-00	TRANS,NPN MPS6507 TO-92 SM-SIG GVG/A70-SB8026-00 N	2
156	Q102,Q201	SB8035-00	TRANS,PNP MPSH81 TO-92 SM-SIG GVG/A70-SB8035-00 A2	2
271	U521	SB8055-00	TRANS,NPN MPQ2222 TO-116 SM-SIG GVG/A70-SB8055-00 A1	1
157	U107,U215,U624	SC0125-01	IC,LIN CA3080E 8 DIP GVG/A70-SC0125-01 A2	3
301	U513	SC0156-00	IC,LIN MC1496L 14 DIP GVG/A70-SC0156-00 A2	1
160	U300	SC0451-00	IC,LIN MC1404AU5 8 DIP GVG/A70-SC0451-00 A1	1
161	U520,U626,U627	SC0483-00	IC,HCMOS MC74HC4538N 16 DIP GVG/A70-SC0483-00 A2	3
162	U202,U514	SC0488-00	IC,LIN DAC0802LCJ 16 DIP ANG/DAC-08HD	2
163	U210	SC0612-00	IC,HCMOS 74HC14N 14 DIP GVG/A70-SC0612-00 A2	1
164	U109,U208,U209,U216, U401,U509,U510,U621, U622,U623,	SC0628-00	IC,LIN LF353N 8 DIP ANG/AD642JH	10
166	D100,D209	SC0897-00	IC,LIN LM336Z-2.5 VOLT REF TO-92 GVG/A70-SC0897-00 A2	2
167	U111,U217	SC0898-01	IC,LIN TDC1016N7C8 24 DIP GVG/A70-SC0898-01 A5	2
177	ECO# Z098 U200,U201,U500,	SC1005-00	IC,CMOS CDG308N 16 DIP CLG/CDG308N	3
050	U710 054222-00	SC1018-00	IC,MEM CY7C225-30PC 24 DIP AMD/AM27S25APC	1

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211	U519	SC1340-00	IC,LIN LM1881N 8 DIP GVG/A70-SC1340-00 A1	1
169	U19,U20,	SC1344-00	IC,ASIC VID LINE DRVR 52 PLCC VTC/VS621PLJ	2
170	U301	SC1354-00	IC,LIN LM324N 14 DIP GVG/A70-SC1354-00 A1	1
171	U400	SC1410-00	IC,ASIC SYNC SEP & CLAMP 44 PLCC AT&T/LB1174AP	1
172	U402	SC1411-01	IC,ASIC COLORLOCK 44 PLCC AT&T/LB1182BP	1
173	U502,U503,U504,U505, U712,U718,	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	6
174	U518,U608,U613,U614, U615,U625	SC1453-00	IC,ACMOS 74ACT74 14 DIP GVG/A70-SC1453-00 A2	6
262	U10	SC1461-00	IC,ACMOS 74AC573 20 DIP GVG/A70-SC1461-00 A2	1
257	U15,U16,U17,	SC1462-00	IC,ACMOS 74AC574 20 DIP GVG/A70-SC1462-00 A2	3
175	U713,U717	SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC NSC/SCX6244UEC/V2	2
178	U719 054225-00	SC1633-00	IC,MEM CY7C245-35PC 24 DIP CYP/CY7C245-35PC	1
179	U12	SC1641-00	IC,ACMOS 74ACT245PC 20 DIP NSC/74ACT245PC	1
180	U714,U715,U716	SC1643-00	IC,ACMOS 74ACT283PC 16 DIP HAR/CD74ACT283E	3
181	U11,U13,U515,U516,	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	4
182	U700	SC1703-00	IC,ASIC DGTL FIR FLTR 144 PGA VLS/VF4680	1
183	U612	SC1712-00	IC,ACMOS 74ACT00 14 DIP GVG/A70-SC1712-00 A2	1
184	U14,U18,U508,U605, U606,U607,U609,U610, U611,U705,U706,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	11
185	U601 054212-00 U722 054217-00	SC1714-00	IC,EPLD SAM448-25S 28 DIP ATR/EPS448PC-25	2
186	U701,U702,U703,	SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	3
243	U511	SC1723-00	IC,ACMOS 74ACT541 20 DIP GVG/A70-SC1723-00 A2	1
187	U517	SC1743-00	IC,ACMOS 74ACT86 14 DIP GVG/A70-SC1743-00 A2	1
210	U723	SC1818-00	IC,ASIC 12 BIT MIXER 84 PLCC VLS/VF4730	1
188	U9 054213-00 U501 054205-01 U704 054224-00 U707 054214-00 U709 054215-00	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	10

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188	U711 054223-00 U724 054219-00 U725 054218-00 U726 054220-00 U727 054221-00	SC1824-00	CONTINUED FROM PREVIOUS PAGE AMD/AMPALCE22V10H-25PC	
190	U600 054211-00 U602 054209-00 U603 054211-00	SC1946-00	IC,UP AM29CPL154H-25DC 28 DIP AMD/AM29CPL154H-25DC	3
168	U200,U201,U500	SC1949-00	IC,I/F DG442DJ 16 DIP SIL ONLY SIL/DG442DJ	3
197	U506 054206-00 U507 054114-02 U604 054208-01 U708 054210-00	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	4
209	U616,U617,U618,U619, U620,	SC2009-00	IC,FTTL 74F525 28 PLCC NSC/74F525QC	5
258	U512 054207-01	SC2012-00	IC,EPLD EP910-LC-30 44 PLCC OTP ATR/EP910LC-30	1
259	U734 054216-00	SC2042-00	IC,PAL PALCE26V12H-20PC 28 SKY DIP AMD/PALCE26V12H-20PC	1
272	Q504	SC2160-00	IC,LIN LM35CAZ TO-92 NSC/LM35CAZ	1
212	U210,U301,U502, U503,U504,U505,U513, U517,U518,U521,U608, U612,U613,U614,U615, U625,U712,U718,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	18
213	U11,U13,U200,U201, U202,U500,U514,U515, U516,U520,U626, U627,U714,U715,U716,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	15
214	U111,U217	SE8019-05	SKT,IC 24 DIP .6 CB BLK STR LEG AMP/2-640361-3	2
215	U107,U109,U208,U209, U215,U216,U300,U401, U509,U510,U519,U621, U622,U623,U624,	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	15
216	U10,U12,U14,U15, U16,U17,U18,U508, U511,U605,U606,U607, U609,U610,U611,U705, U706	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	17
217	U9,U501,U506,U507, U604,U701,U702,U703, U704,U707,U708,U709, U710,U711,U719,U720, U721,U724,U725,U726, U727,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	21
218	U400,U402,U512,U713, U717	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK AMP/3-821688-1	5

REPLACEMENT PARTS LIST

BRD,PAL ANALOG INTERFACE
ASSEMBLY NUMBER: 064722-00 ISSUE: K ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
219	U19,U20,	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	2
322	ECO# Z333 U723,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	1
222	U723	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	1
220	U700	SE8165-00	SKT,IC 145 PIN GRID ARRAY TIN MEY/MP145-16212D	1
221	U600,U601,U602,U603, U722,U734,	SE8166-00	SKT,IC 28 DIP .3 CB BLK BUR/DILB28SP-8JKT	6
234	U102,U105,U214	SE8175-05	SKT,HYBRID 5PIN SIP MLM/714-99-105-31-012	3
235	U1,U206,U207	SE8175-08	SKT,HYBRID 8PIN SIP MLM/714-99-108-31-012	3
236	U4,U6,U8	SE8175-09	SKT,HYBRID 9PIN SIP MLM/714-99-109-31-012	3
237	U2,U106,U108,U110, U203,U204,U205,U211, U212,U213, RN1	SE8175-10	SKT,HYBRID 10PIN SIP MLM/714-99-110-31-012	11
238	U100,U101,U103,U104	SE8175-15	SKT,HYBRID 15PIN SIP MLM/714-99-115-31-012	4
239	U403	SE8175-16	SKT,HYBRID 16PIN SIP MLM/714-99-116-31-012	1
240	U3,U5,U7	SE8175-18	SKT,HYBRID 18PIN SIP MLM/714-99-118-31-012	3
242	U616,U617,U618,U619, U620,	SE8179-00	SKT,IC 28 PLCC .685 SQ AMP/3-821581-1	5
191	S1,S2,S300,S301	TA6067-00	TUR PN,.04X.15L .0625 PCB GOLD CAM/460-2971-02-03-00	8
192	TP1,TP2,TP3,TP4,TP5, TP6,TP7,TP8,TP9,TP10 TP11,TP12, TP100,TP101,TP102, TP103,TP104,TP105, TP106,TP107,TP108, TP109,TP200,TP201, TP202,TP203,TP204, TP205,TP206,TP207, TP208,TP209,TP210, TP400,TP401,TP402, TP403,TP404,TP405, TP406,TP407,TP408, TP500,TP501,TP502, TP503,TP504,TP505, TP600,TP601,TP602, TP603,TP604,TP605, TP700,TP701,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	56
193	L101,L201,	ZB4009-01	INDCTR,MINI .47UH 5% DAL/IM2-12-.47UH-5%	2

REPLACEMENT PARTS LIST

BRD,PAL ANALOG INTERFACE
ASSEMBLY NUMBER: 064722-00 ISSUE: K ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
195	L100,L200,	ZB4013-01	INDCTR,MINI 1UH 5% DEL/1025-20J	2
196	L500,L501,L503	ZB4019-01	INDCTR,MINI 3.3UH 5% DAL/IM2-12-3.3UH-5%	3
198	L502,	ZB4026-00	INDCTR,MINI 12UH 10% DAL/IM2-12-12UH-10%	1
199	L401	ZB4028-01	INDCTR,MINI 18UH 5% DEL/1025-50J	1
201	L400	ZB4037-00	INDCTR,MINI 100UH 10% DAL/IM2-12-100UH-10%	1
202	L402	ZB4045-00	INDCTR,MINI 470UH 10% DAL/IM2-12-470UH-10%	1
203	FB1,FB2,FB3,FB4,	ZB4131-00	INDCTR,FERRITE BEAD 131 OHM@100MHZ FPC/2643021801	4
204	L102,L205,	ZB4139-00	INDCTR,ADJ 7.6-11.4UH SHLD CLC/SLOT TEN-4-07	2
205	L103,L207,	ZB4141-00	INDCTR,ADJ 22.4-33.6UH SHLD CLC/SLOT TEN-4-10	2
206	L107,L210,	ZB4142-00	INDCTR,ADJ 5.2-7.8UH SHLD CLC/SLOT TEN-4-06	2
207	FB5,FB6,FB100,FB101, FB102,FB103,FB104, FB105,FB200,FB201,	ZB4211-00	INDCTR,FERRITE BEAD WIRED 34 OHMS FER/11413-3B	10
232	L105,L106,L208,L209,	ZB4224-00	INDCTR,ADJ 11.2-16.8UH SHIELDED CLC/SLOT TEN-4-08	4
208	L1,L2,L3,	ZB4225-00	INDCTR,ADJ 0.80-1.0UH SHIELDED CLC/SLOT TEN-4-01	3

REPLACEMENT PARTS LIST

BRD,D2 INPUT SUBMODULE
ASSEMBLY NUMBER: 064726-00 ISSUE: C ECN: Z190

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D07/08	000000-00	REFERENCE DOCUMENTS	0
101		044726-01	PCB,D2 INPUT SUBMODULE	1
039	C50	CB0285-00	CAP,CER .047UF 10% 50WV X7R KEM/C322C473K5R5CA	1
002	C3,C4,C5,C6,C7, C10,C11,C12,C13,C14, C15,C16,C17,C18,C19, C20,C21,C24,C25,C26, C27,C28,C29,C30,C31, C32,C33,C34,C35,C36, C37,C38,C39,C40,C41, C42,C43,C44,C45,C46, C47,C48,C49,	CB0354-00	CAP,CER .1UF 20% 50WV Z5U AXIAL MUR/RPA10Z5U104M50PT	43
003	C1,C2,C22,C23	CB2235-00	CAP,MICA D10 220PF 5% 500WV COD/CD10FD221J03	4
004	C8,C9	CB4036-00	CAP,TANT 5.6UF 10% 20WV GVG/A70-CB4036-00 A1	2
050	FOR J1 POSITION 53 J2 POSITION 3	CF1241-00	CONN,KEY PL NYL AMP/86286-1	2
005	J1,J2	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
006	U0105,U0108,U0114, U0117,U0201,U0203, U0204,U0206,U0207, U0209,U0210,U0212, U0213,U0215,U0216, U0218,	HB9067-01	HYBRID,DIGITAL INPUT TERMINATION GVG/HB9067-01	16
007	R6,R17,R20,R30,	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	4
008	R2,R13	RB2111-00	RES,110 OHM 2% 1/4W MTL FLM GVG/A70-RB2111-00 A1	2
009	R7,R18,R19,R31,	RB2221-00	RES,220 OHM 2% 1/4W MTL FLM GVG/A70-RB2221-00 A1	4
037	R21	RB2431-00	RES,430 OHM 2% 1/4W MTL FLM GVG/A70-RB2431-00 A1	1
038	R22	RB2472-00	RES,4.7K OHM 2% 1/4W MTL FLM GVG/A70-RB2472-00 A1	1
010	R8,R9	RB2510-00	RES,51 OHM 2% 1/4W MTL FLM GVG/A70-RB2510-00 A1	2
040	R24,R25,R26,R27	RB2511-00	RES,510 OHM 2% 1/4W MTL FLM GVG/A70-RB2511-00 A1	4
011	R1,R3,R4,R5,R12, R14,R15,R16	RB2561-00	RES,560 OHM 2% 1/4W MTL FLM GVG/A70-RB2561-00 A1	8
028	8 EA SF2003-00	SA1052-01	SCRW,MACH 4-40X.1875L PH PNH W/NYL MACH 4-40X.1875L PH PNH W/NYL ZINC	8
012	U0202,U0205,U0208, U0211,U0214,U0217	SC0639-00	IC,ECL MC10114P 16 DIP GVG/A70-SC0639-00 A1	6
027	U0303,U0306,U0309,	SC0721-00	IC,ECL MC10125P 16 DIP	5

REPLACEMENT PARTS LIST

BRD,D2 INPUT SUBMODULE
ASSEMBLY NUMBER: 064726-00 ISSUE: C ECN: Z190

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
	U0313,U0316		GVG/A70-SC0721-00 A3	
013	U0705	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	1
014	U0618,U0701	SC1453-00	IC,ACMOS 74ACT74 14 DIP GVG/A70-SC1453-00 A2	2
015	U0516,U0703	SC1454-00	IC,ACMOS 74AC86 14 DIP GVG/A70-SC1454-00 A2	2
016	U0712	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	1
017	U0404,U0604	SC1702-00	IC,ASIC NTSC/PAL ENC/DEC 120 PGA VLS/VF4678	2
018	U0416,U0418,U0709, U0809,U0814	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	5
019	U0410,U0610	SC1718-00	IC,ASIC DGTL VID 4-LN DLY 84 PLCC VLS/VF4696	2
020	U0414	SC1720-00	IC,ACMOS 74ACT157 16 DIP GVG/A70-SC1720-00 A1	1
021	U0716	SC1723-00	IC,ACMOS 74ACT541 20 DIP GVG/A70-SC1723-00 A2	1
023	U0614,U0616	SC1906-00	IC,MEM TMS4C1050-40N 16 DIP OKI/MSM514221-6RS	2
022	ECO# Z253 U0410,U0610,	SC2060-00	IC,ASIC DGTL 4 LN DLY/ADDS 84 PLCC NSC/MM9249	2
030	U0516,U0618,U0701, U0703,U0705,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	5
031	U0202,U0205,U0208, U0211,U0214,U0217, U0303,U0306,U0309, U0313,U0316,U0414, U0614,U0616,U0712,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	15
032	U0416,U0418,U0709, U0716,U0809,U0814,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	6
134	ECO# Z333 U0410,U0610,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	2
034	U0410,U0610,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	2
033	U0404,U0604,	SE8167-00	SKT,IC 121 PGA 13X13 LIF AMP/55273-2	2
035	U0105,U0108,U0114, U0117,U0201,U0203, U0204,U0206,U0207, U0209,U0210,U0212, U0213,U0215,U0216, U0218,	SE8175-07	SKT,HYBRID 7PIN SIP MLM/714-99-107-31-012	16
029	FOR MOUNTING ON 064702-00	SF2003-00	SPCR,4-40 .25 HEX .375L BRS ZINC GVG/A70-SF2003-00 A1	4
025	TP1,TP2,TP3,TP4,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	4
026	FB1,FB2	ZB4211-00	INDCTR,FERRITE BEAD WIRED 34 OHMS FER/11413-3B	2

REPLACEMENT PARTS LIST

BRD,D2 PAL INPUT SUBMODULE
ASSEMBLY NUMBER: 064727-00 ISSUE: ECN: Z149

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
101	X2 FAB	044727-00	PCB,02 PAL INPUT SUBMODULE	1
002	C3,C4,C5,C6,C7,C8, C11,C12,C13,C14,C15, C17,C18,C19,C20,C21, C24,C25,C26,C27,C28, C29,C30,C31,C32,C34, C35,C36,C37,C38,C39, C40,C41,C42,C43,C44, C45,C46,C47,C48,C49, C83,C86,C87,C88,C105	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	46
010	C89,C90,C91,C92,C93, C127	CB0283-00	CAP,CER 1000PF 10% 50WV X7R KEM/C317C102K5R5CA	6
050	C84	CB0354-00	CAP,CER .1UF 20% 50WV Z5U AXIAL MUR/RPA10Z5U104M50PT	1
003	C1,C2,C22,C23,	CB2235-00	CAP,MICA D10 220PF 5% 500WV COD/CD10FD221J03	4
004	C9,C85,	CB4036-00	CAP,TANT 5.6UF 10% 20WV GVG/A70-CB4036-00 A1	2
105	FOR J1 PIN 53, J2 PIN 3	CF1241-00	CONN,KEY PL NYL AMP/86286-1	2
005	J1,J2,	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
006	DL1	DA4165-00	DLY LN,TTL 50NS W/5NS TAPS DDD/DDU-7F-8955	1
007	U0105,U0108,U0114, U0117,U0201,U0203, U0204,U0206,U0207, U0209,U0210,U0212, U0213,U0215,U0216, U0218,	HB9067-01	HYBRID,DIGITAL INPUT TERMINATION GVG/HB9067-01	16
009	R2,R13,	RB2111-00	RES,110 OHM 2% 1/4W MTL FLM GVG/A70-RB2111-00 A1	2
008	R226,R230,	RB2201-00	RES,200 OHM 2% 1/4W MTL FLM GVG/A70-RB2201-00 A1	2
011	R29,R233	RB2221-00	RES,220 OHM 2% 1/4W MTL FLM GVG/A70-RB2221-00 A1	2
051	R234	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	1
012	R28,	RB2472-00	RES,4.7K OHM 2% 1/4W MTL FLM GVG/A70-RB2472-00 A1	1
013	R24,R25,R26,R27,	RB2511-00	RES,510 OHM 2% 1/4W MTL FLM GVG/A70-RB2511-00 A1	4
014	R1,R3,R4,R5,R12, R14,R15,R16,	RB2561-00	RES,560 OHM 2% 1/4W MTL FLM GVG/A70-RB2561-00 A1	8
015	R11,R222,R223,R224, R225,R229,R231,R232,	RB2750-00	RES,75 OHM 2% 1/4W MTL FLM GVG/A70-RB2750-00 A1	8
036	8 EA SF2003-00	SA1052-01	SCRW,MACH 4-40X.1875L PH PNH W/NYL MACH 4-40X.1875L PH PNH W/NYL ZINC	8
016	U0202,U0205,U0208,	SC0639-00	IC,ECL MC10114P 16 DIP	6

REPLACEMENT PARTS LIST

BRD,D2 PAL INPUT SUBMODULE
ASSEMBLY NUMBER: 064727-00 ISSUE: ECN: Z149

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
	U0211,U0214,U0217,		GVG/A70-SC0639-00 A1	
029	U303,U306, U0309,U0313,U0316,	SC0721-00	IC,ECL MC10125P 16 DIP GVG/A70-SC0721-00 A3	5
017	U0714,U0716,U0717,	SC1453-00	IC,ACMOS 74ACT74 14 DIP GVG/A70-SC1453-00 A2	3
018	U0807,U0817,	SC1454-00	IC,ACMOS 74AC86 14 DIP GVG/A70-SC1454-00 A2	2
019	U0809,U0811,	SC1462-00	IC,ACMOS 74AC574 20 DIP GVG/A70-SC1462-00 A2	2
020	U0812,	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	1
021	U0404,U0709,	SC1702-00	IC,ASIC NTSC/PAL ENC/DEC 120 PGA VLS/VF4678	2
022	U0414,U0416,U0814, U0517	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	4
024	U0413,	SC1720-00	IC,ACMOS 74ACT157 16 DIP GVG/A70-SC1720-00 A1	1
025	U0816,	SC1723-00	IC,ACMOS 74ACT541 20 DIP GVG/A70-SC1723-00 A2	1
026	U0417,U0514,U0516, U0617,	SC1906-00	IC,MEM TMS4C1050-40N 16 DIP OKI/MSM514221-6RS	4
023	U0509,U0604,U0804,	SC2060-00	IC,ASIC DGTL 4 LN DLY/ADDS 84 PLCC NSC/MM9249	3
031	U0714,U0716,U0717, U0807,U0817,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	5
032	U303,U306,U0202, U0205,U0208,U0211, U0214,U0217,U0309, U0313,U0316,U0413, U0417,U0514,U0516, U0617,U0812,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	17
033	U0414,U0416,U0809, U0811,U0814,U0816, U0517	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	7
035	U0404,U0709,	SE8093-00	SKT,IC 120 PGA 13X13 LIF AMP/55273-1	2
134	ECO# Z333 U0509,U0604,U0804,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	3
034	U0509,U0604,U0804,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	3
030	U0105,U0108,U0114, U0117,U0201,U0203, U0204,U0206,U0207, U0209,U0210,U0212, U0213,U0215,U0216, U0218,	SE8175-07	SKT,HYBRID 7PIN SIP MLM/714-99-107-31-012	16
037	FOR MOUNTING ON 064722-00	SF2003-00	SPCR,4-40 .25 HEX .375L BRS ZINC GVG/A70-SF2003-00 A1	4
027	TP1,TP2,TP3,TP4,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	4

REPLACEMENT PARTS LIST

BRD,D2 PAL INPUT SUBMODULE
ASSEMBLY NUMBER: 064727-00 ISSUE: ECN: Z149

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
028	FB1,FB2,	ZB4211-00	INDCTR,FERRITE BEAD WIRED 34 OHMS FER/11413-3B	2

REPLACEMENT PARTS LIST

BRD,VIDEO RAM MEZZANINE NTSC
ASSEMBLY NUMBER: 064731-00 ISSUE: B ECN: Z007

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	10-HB9116-00 10-064731-00 55-044731-02	000000-00	REFERENCE DOCUMENTS	0
001		044731-01	PCB,PAL VIDEO RAM MEZZANINE	1
002		044731-02	PCB,VIDEO RAM MEZZANINE	1
003	C1-C7	QC1000-02	CAP,CER .1UF 10% 50V 1206 X7R KEM/C1206C104K5RAC	7
004	R1-R8	QR1006-01	RES,10K OHM 5% 1/8W 1206 DAL/CRCW1206103JT	8
005	U11	QS1042-00	IC,ACMOS 74ACT574 SOL-20 GVG/A70-QS1042-00 A1	1
006	U1-U6	QS1080-40	IC,MEM MCM6290BJ35 SOL-24 MOT/MCM6290BJ35R2	6
008	U12	QS1084-00	IC,CMOS 74FCT139 SO-16 GVG/A70-QS1084-00 A1	1
007	U10	QS1085-00	IC,ACMOS 74ACT573 SOL-20 GVG/A70-QS1085-00 A1	1

REPLACEMENT PARTS LIST

BRD,VIDEO RAM MEZZANINE PAL
ASSEMBLY NUMBER: 064731-10 ISSUE: A ECN: Z074

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	10-HB9116-10 REF 10-064731-10 55-044731-02	000000-00	REFERENCE DOCUMENTS	0
001		044731-02	PCB,VIDEO RAM MEZZANINE	1
002	C1-C7	QC1000-02	CAP,CER .1UF 10% 50V 1206 X7R KEM/C1206C104K5RAC	7
003	R1-R8	QR1006-01	RES,10K OHM 5% 1/8W 1206 DAL/CRCW1206103JT	8
004	U11	QS1042-00	IC,ACMOS 74ACT574 SOL-20 GVG/A70-QS1042-00 A1	1
005	U9	QS1079-00	IC,MEM MCM6264-J35 SOL-28 GVG/A70-QS1079-00 O	1
006	U1-U8	QS1080-40	IC,MEM MCM6290BJ35 SOL-24 MOT/MCM6290BJ35R2	8
007	U12	QS1084-01	IC,CMOS 74FCT139A SO-16 GVG/A70-QS1084-01 A1	1
008	U10	QS1085-00	IC,ACMOS 74ACT573 SOL-20 GVG/A70-QS1085-00 A1	1

REPLACEMENT PARTS LIST

BRD,RECURSIVE MEMORY RAM MEZZANINE
ASSEMBLY NUMBER: 064732-00 ISSUE: C ECN: H507

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	PCB-A1 VERSION	044732-01	PCB,RECURSIVE MEMORY RAM MEZZANINE	1
002	J1	CF1853-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534206-8	1
003	C1,C2,C3,C4,C5,C6 C7,C8,C10,C11,C12 C13,C14,C16,C17 C18,C19,C20,C22 C23,C24,C25,C26 C28,C29,C30,C31,C32 C34,C35,C36,C37 C38,C40,C41,C42	QC1000-02	CAP,CER .1UF 10% 50V.1206 X7R KEM/C1206C104K5RAC	36
004	R2	QR1000-01	RES,100 OHM 5% 1/8W 1206 DAL/CRCW1206101JT	1
005	U11,U17,U23,U29 U35,U41	QS1034-00	IC,ACMOS 74ACT244 SOL-20 HAR/CD74ACT244M	6
012	U6,U12,U18,U24 U30,U36	QS1037-00	IC,CMOS 29C821 SOL-24 AMD/AM29C821SC	6
011	U10,U16,U22,U28 U34,U40	QS1038-00	IC,CMOS 29C823 SOL-24 AMD/AM29C823SC	6
008	U2	QS1039-00	IC,ACMOS 74ACT175 SO-16 GVG/A70-QS1039-00 A1	1
006	U1	QS1040-00	IC,ACMOS 74ACT174 SO-16 GVG/A70-QS1040-00 A1	1
010	U4	QS1041-00	IC,ACMOS 74ACT138 SO-16 GVG/A70-QS1041-00 A1	1
007	U3,U5	QS1042-00	IC,ACMOS 74ACT574 SOL-20 GVG/A70-QS1042-00 A1	2
009	U7,U8,U13,U14,U19 U20,U25,U26,U31,U32 U37,U38	QS1043-40	IC,MEM PG51256SL-10 SOL-28 GVG/A70-QS1043-40 A2	12

REPLACEMENT PARTS LIST

BRD,RECURSIVE MEM RAM MEZZANINE PAL
ASSEMBLY NUMBER: 064732-10 ISSUE: C ECN: H507

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	PCB-A1 VERSION	044732-01	PCB,RECURSIVE MEMORY RAM MEZZANINE	1
002	J1	CF1853-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534206-8	1
013	C1,C2,C3,C4,C5,C6,C7 C8,C9,C10,C11,C12 C13,C14,C15,C16,C17 C18,C19,C20,C21,C22 C23,C24,C25,C26,C27 C28,C29,C30,C31,C32 C33,C34,C35,C36,C37 C38,C39,C40,C41,C42	QC1000-02	CAP,CER .1UF 10% 50V 1206 X7R KEM/C1206C104K5RAC	42
004	R2	QR1000-01	RES,100 OHM 5% 1/8W 1206 DAL/CRCW1206101JT	1
005	U11,U17,U23,U29 U35,U41	QS1034-00	IC,ACMOS 74ACT244 SOL-20 HAR/CD74ACT244M	6
012	U6,U12,U18,U24,U30 U36	QS1037-00	IC,CMOS 29C821 SOL-24 AMD/AM29C821SC	6
011	U10,U16,U22,U28,U34 U40	QS1038-00	IC,CMOS 29C823 SOL-24 AMD/AM29C823SC	6
008	U2	QS1039-00	IC,ACMOS 74ACT175 SO-16 GVG/A70-QS1039-00 A1	1
006	U1	QS1040-00	IC,ACMOS 74ACT174 SO-16 GVG/A70-QS1040-00 A1	1
010	U4	QS1041-00	IC,ACMOS 74ACT138 SO-16 GVG/A70-QS1041-00 A1	1
007	U3,U5	QS1042-00	IC,ACMOS 74ACT574 SOL-20 GVG/A70-QS1042-00 A1	2
009	U7,U8,U9,U13,U14, U15,U19,U20,U21,U25, U26,U27,U31,U32,U33, U37,U38,U39	QS1043-40	IC,MEM PG51256SL-10 SOL-28 GVG/A70-QS1043-40 A2	18

REPLACEMENT PARTS LIST

BRD,PAL INPUT SUBMODULE
ASSEMBLY NUMBER: 064735-00 ISSUE: C ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
100		044735-00	PCB,INPUT SUBMODULE	1
101	F1	BC7001-00	BUS STP,24.0L 1 SP 24 PIN BEI/B13903-0T	3
021	C4,C129	CB0119-00	CAP,CER .22UF 10% 50WV X7R AVX/SR305C224KAA	2
002	C60,C61,C62,C63,C64, C85,C86,C90,C91 C92,C93,C95,C96,C100 C101,C104,C105,C107, C108,C109,C110,C113, C114,C115,C116,C118, C119,C120,C121,C122, C123,C124,C125,C127, C128,C130,C131,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	37
001	C43	CB0281-00	CAP,CER 2200PF 10% 50WV X7R KEM/C317C222K5R5CA	1
020	C2,C5,C102,C103, C106,C111,C112,C117	CB0283-00	CAP,CER 1000PF 10% 50WV X7R KEM/C317C102K5R5CA	8
003	C3,C33,C40,C41,C44, C46,C51,C53,C77,C80, C88,C89,C94,C97	CB0354-00	CAP,CER .1UF 20% 50WV Z5U AXIAL MUR/RPA10Z5U104M50PT	14
122	C36	CB2201-00	CAP,MICA D10 1PF +/-.5PF 500WV COD/CD10CD010D03	1
004	C24,C25,C31,C47,	CB2203-00	CAP,MICA D10 3PF +/-.5PF 500WV COD/CD10CD030D03	4
005	C32	CB2205-00	CAP,MICA D10 10PF 5% 500WV COD/CD10CD100J03	1
121	C35	CB2209-00	CAP,MICA D10 20PF 5% 500WV COD/CD10ED200J03	1
007	C23,C34,	CB2210-01	CAP,MICA D10 22PF +/-1PF 500WV COD/CD10ED220C03	2
009	C83,C84,	CB2214-01	CAP,MICA D10 33PF +/-1PF 500WV COD/CD10ED330C03	2
010	C26	CB2217-01	CAP,MICA D10 43PF +/-1PF 500WV COD/CD10ED430C03	1
011	C28	CB2218-01	CAP,MICA D10 47PF 2% 500WV COD/CD10ED470G03	1
012	C30	CB2220-01	CAP,MICA D10 51PF 1% 500WV COD/CD10ED510F03	1
013	C81,C82	CB2221-00	CAP,MICA D10 56PF 5% 500WV COD/CD10ED560J03	2
014	C27	CB2223-01	CAP,MICA D10 68PF 1% 500WV COD/CD10ED680F03	1
015	C22	CB2226-01	CAP,MICA D10 91PF 1% 500WV COD/CD10FD910F03	1
016	C21,C42	CB2227-01	CAP,MICA D10 100PF 1% 500WV COD/CD10FD101F03	2
017	C29,C37	CB2258-00	CAP,MICA D10 8PF +/-.5PF 500WV COD/CD10CD080D03	2

REPLACEMENT PARTS LIST

BRD,PAL INPUT SUBMODULE
ASSEMBLY NUMBER: 064735-00 ISSUE: C ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION	MFG CODE/PART NUMBER	QTY
018	C38,C48,C49	CB2265-01	CAP,MICA D10 75PF 1% 500WV	COD/CD10ED750F03	3
022	C6,C7,C45,C50,C52, C54,C126	CB4036-00	CAP,TANT 5.6UF 10% 20WV	GVG/A70-CB4036-00 A1	7
023	C20	CB5001-00	CAP,VAR 2.5-9PF 100WV TOP	GVG/A70-CB5001-00 A4	1
024	J40	CF0676-03	CONN,PL HDR 3POS 1ROW PCB MNT	3M/929647-01-03-30	1
105	FOR J1 PIN 53, J2 PIN 3	CF1241-00	CONN,KEY PL NYL	AMP/86286-1	2
025	J1,J2	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT	AMP/2-534998-8	2
019	DL70	DA4165-00	DLY LN,TTL 50NS W/5NS TAPS	DDD/DDU-7F-8955	1
026	U20,U21,U22	HB9032-20	HYBRID,VIDEO AMPLIFIER	GVG/HB9032-20	3
027	U1,U4	HB9049-10	HYBRID,EQUALIZING AMP (NPN OUTPUT)		2
028	U41	HB9120-00	HYBRID,SUBCARRIER FILTER	GVG/HB9120-00	1
029	R2,R14	PD2024-00	POT,TRIM CERMET 5K 10% TOP	BOR/3329H-1-502	2
030	R43	PD2025-00	POT,TRIM CERMET 200 10% TOP	BOR/3329H-1-201	1
031	R45	PD2027-00	POT,TRIM CERMET 2K 10% TOP	BOR/3329H-1-202	1
032	R100,R101,R102,R103, R104,R105	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM	GVG/A70-RB2101-00 A1	6
058	R6,R8,	RB2105-00	RES,1 MEG OHM 2% 1/4W MTL FLM	GVG/A70-RB2105-00 A1	2
033	R7,R10	RV1000-00	RES,100 OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 100 OHM 1%	2
034	R3,R11,R13,R22,R26, R88	RV1001-00	RES,1K OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 1K 1%	6
035	R27,R47,R82,R83,R85	RV1002-00	RES,10K OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 10K 1%	5
055	R106	RV1051-03	RES,1050 OHM .1% 1/8W MTL FLM	DAL/CMF-55 T2 1.05K .1%	1
036	R48	RV1152-00	RES,11.5K OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 11.5K 1%	1
057	R51	RV1210-00	RES,121 OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 121 OHM 1%	1
037	R80,R87	RV1500-00	RES,150 OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 150 OHM 1%	2
038	R25,R30,R31,R49	RV1501-00	RES,1.5K OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 1.5K 1%	4
040	R23	RV2001-00	RES,2K OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 2K 1%	1
039	R20,R46	RV2210-00	RES,221 OHM 1% 1/8W MTL FLM	DAL/CMF-55 T-1 221 OHM 1%	2

REPLACEMENT PARTS LIST

BRD,PAL INPUT SUBMODULE
ASSEMBLY NUMBER: 064735-00 ISSUE: C ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
041	R21,R24,R28,R29, R33,R34,	RV3010-03	RES,301 OHM .1% 1/8W MTL FLM DAL/CMF-55 T-2 301 OHM .1%	6
042	R1,R9	RV3320-00	RES,332 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 332 OHM 1%	2
043	R40,R44	RV3321-03	RES,3.32K OHM .1% 1/8W MTL FILM DAL/CMF-55 T-2 3.32K .1%	2
087	R50	RV3920-00	RES,392 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 392 OHM 1%	1
062	R32	RV4220-03	RES,422 OHM .1% 1/8W MTL FLM DAL/CMF-55 T2 422 OHM .1%	1
044	R4,R12	RV4990-00	RES,499 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 499 OHM 1%	2
045	R41,R42,R81,R84, R86,R89,R90	RV4992-00	RES,49.9K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 49.9K 1%	7
046	R91,R92	RV6811-00	RES,6.81K OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 6.81K 1%	2
088	8 EA SF2003-00	SA1052-01	SCRW,MACH 4-40X.1875L PH PNH W/NYL MACH 4-40X.1875L PH PNH W/NYL ZINC	8
047	D1,D2,D3,D4, D81,D82	SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	6
048	D80	SB5015-00	DIODE,VARC MV2109 TO-226A 30-36PF MOT/MV2109	1
049	Q1,Q2	SB6018-00	TRANS,FET SD215 TO-72-33 CLG/SD215DEG	2
050	Q41	SB8004-00	TRANS,PNP 2N4126 TO-92 SM-SIG GVG/A70-SB8004-00 A2	1
051	Q40	SB8005-00	TRANS,NPN 2N4265 TO-92 SM-SIG GVG/A70-SB8005-00 A3	1
052	U40	SC0125-01	IC,LIN CA3080E 8 DIP GVG/A70-SC0125-01 A2	1
053	U80	SC0250-00	IC,CMOS MC14052BCP 16 DIP GVG/A70-SC0250-00 A1	1
054	U82	SC0488-00	IC,LIN DAC0802LCJ 16 DIP ANG/DAC-08HD	1
056	U42,U81	SC0628-00	IC,LIN LF353N 8 DIP ANG/AD642JH	2
059	D40	SC0897-00	IC,LIN LM336Z-2.5 VOLT REF TO-92 GVG/A70-SC0897-00 A2	1
060	U2,U3	SC1093-01	IC,LIN XPT -11MV TO -25MV DC EXR/XR-C0668A	2
061	U75,U76	SC1453-00	IC,ACMOS 74ACT74 14 DIP GVG/A70-SC1453-00 A2	2
064	U77,U83	SC1454-00	IC,ACMOS 74AC86 14 DIP GVG/A70-SC1454-00 A2	2
063	U86	SC1624-00	IC,ACMOS 74ACT244PC 20 DIP NSC/74ACT244PC	1
065	U43	SC1676-01	IC,LIN TDC1038N6C 28 DIP TRW ONLY GVG/A70-SC1676-01 A1	1
066	U87	SC1692-00	IC,ACMOS 74ACT138 16 DIP NSC/74ACT138PC	1

REPLACEMENT PARTS LIST

BRD,PAL INPUT SUBMODULE
ASSEMBLY NUMBER: 064735-00 ISSUE: C ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
067	U61,U64	SC1702-00	IC,ASIC NTSC/PAL ENC/DEC 120 PGA VLS/VF4678	2
068	U70,U84,U85,U100, U101,U102,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	6
069	U60,U62,U63	SC1718-00	IC,ASIC DGTL VID 4-LN DLY 84 PLCC VLS/VF4696	3
093	U71,U72,U73,U74	SC1906-01	IC,MEM MSM514221-4RS 16 DIP OKI/MSM514221-4RS	4
086	ECO# Z253 U60,U62,U63,	SC2060-00	IC,ASIC DGTL 4 LN DLY/ADDS 84 PLCC NSC/MM9249	3
079	U75,U76,U77,U83	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	4
080	U71,U72,U73,U74,U80, U82,U87	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	7
081	U40,U42,U81	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	3
082	U70,U84,U85,U86, U100,U101,U102	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	7
083	U43	SE8035-05	SKT,IC 28 DIP.6 CB BLK STR LEG AMP/2-640362-3	1
184	ECO# Z333 U60,U62,U63,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	3
084	U60,U62,U63	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	3
085	U61,U64	SE8167-00	SKT,IC 121 PGA 13X13 LIF AMP/55273-2	2
090	U41	SE8175-05	SKT,HYBRID 5PIN SIP MLM/714-99-105-31-012	1
091	U1,U4	SE8175-08	SKT,HYBRID 8PIN SIP MLM/714-99-108-31-012	2
092	U20,U21,U22	SE8175-10	SKT,HYBRID 10PIN SIP MLM/714-99-110-31-012	3
089	FOR MOUNTING ON 064722-00	SF2003-00	SPCR,4-40 .25 HEX .375L BRS ZINC GVG/A70-SF2003-00 A1	4
070	TP2,TP3,TP20,TP21, TP22,TP23,TP24,TP25, TP40,TP41,TP42,TP80, TP81	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	13
071	L80,L81,L82	ZB4011-01	INDCTR,MINI .68UH 5% DAL/IM2-12-.68UH-5%	3
072	L83	ZB4017-01	INDCTR,MINI 2.2UH 5% DEL/1025-28J	1
073	L20	ZB4139-00	INDCTR,ADJ 7.6-11.4UH SHLD CLC/SLOT TEN-4-07	1
074	L23	ZB4141-00	INDCTR,ADJ 22.4-33.6UH SHLD CLC/SLOT TEN-4-10	1
075	L21,L22	ZB4142-00	INDCTR,ADJ 5.2-7.8UH SHLD CLC/SLOT TEN-4-06	2
076	FB1,FB2,FB3,FB4, FB5,FB6,FB7,FB8,	ZB4211-00	INDCTR,FERRITE BEAD WIRED 34 OHMS FER/11413-3B	9

REPLACEMENT PARTS LIST

BRD,PAL INPUT SUBMODULE
ASSEMBLY NUMBER: 064735-00 ISSUE: C ECN: Z408

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
076	FB9	ZB4211-00	CONTINUED FROM PREVIOUS PAGE FER/11413-3B	
077	L24	ZB4224-00	INDCTR,ADJ 11.2-16.8UH SHIELDED CLC/SLOT TEN-4-08	1
078	L40	ZB4225-00	INDCTR,ADJ 0.80-1.0UH SHIELDED CLC/SLOT TEN-4-01	1

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D
ASSEMBLY NUMBER: 064741-00 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D45	000000-00	REFERENCE DOCUMENTS	0
024		024700-00	BAR,MODULE SUPPORT	1
025		024701-00	STIFFENER,PC BOARD FRONT DPM-100	1
101		044741-01	PCB,MULTISTANDARD 3D VID CHNL	1
023		064731-00	BRD,VIDEO RAM MEZZANINE NTSC	16
150		064742-00	BRD,3D RAG	1
151		064743-00	BRD,FILTER CONTROL MEZZANINE	1
002	C1,C2,C3,C4,C5,C6, C7,C8,C9,C10,C11, C12,C13,C14,C16,C17, C18,C19,C20,C22,C23, C24,C25,C26,C27,C28, C29,C30,C31,C32,C33, C34,C35,C36,C37,C38, C39,C40,C41,C42,C43, C44,C45,C46,C47,C48, C49,C50,C51,C52,C53, C54,C55,C56,C57,C58, C59,C60,C61,C62,C63, C64,C65,C66,C67,C68, C69,C70,C72,C73,C74, C75,C76,C77,C78,C79, C80,C81,C82,C83,C84, C85,C86,C87,C88,C89, C90,C91,C92,C93,C94, C95,C96,C97,C98,C99, C100,C101,C102,C103, C104,C105,C106,C107, C108,C109,C110,C111, C112,C113,C114,C115, C116,C117,C118,C119, C120,C122,C123,C124, C125,C126,C127,C128, C129,C130,C132,C133, C134,C135,C136,C137, C138,C139,C140,C141, C142,C143,C144,C145, C146,C147,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	142
003	C15,C21,	CB2205-00	CAP,MICA D10 10PF 5% 500WV COD/CD10CD100J03	2
090	C148	CB2209-00	CAP,MICA D10 20PF 5% 500WV COD/CD10ED200J03	1
086	C131	CB2252-00	CAP,MICA D10 1000PF 5% 100WV	1

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D
ASSEMBLY NUMBER: 064741-00 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			COD/D101F102JO3	
004	C121	CB4022-00	CAP,TANT 22UF 10% 15WV GVG/A70-CB4022-00 A1	1
005	EJ1,EJ2,	CC2073-00	CARD EJCTR,NYL BLK .062 THK PCB CAK/107-20	2
006	J4,J7,J8,J9,J10,J11, J12,J13,J14,J15,J16, J17,J18,J19,J36,J38, J39,J41,	CF0676-10	CONN,PL HDR 10POS 1ROW PCB MNT DCS/65507-110	18
007	J1,J3,	CF1039-00	CONN,PL 96POS 3ROW RTANG PAN ONLY GVG/A70-CF1039-00 A1	2
008	J20,J21,J22,J23,J24, J25,J26,J27,J28,J29, J30,J31,J32,J33,J34, J35,	CF1067-02	CONN,PL 80POS 1ROW SIMM TIN PLT BUR/SIME80PSB2	16
009	J5,J6,J37,J40,	CF1720-00	CONN,PL HDR 56POS 2ROW VERT PCB MNT AMP/2-103186-8	4
010	J2,	CF1883-00	CONN,PL 96POS 3ROW RTANG PCB 5KEYED PAN/100-096-2007	1
011	Y1,	CJ2025-00	CRYSTAL,24MHZ CTK/MP240	1
013	U0615,U1315,	QS1184-00	IC,ASIC DGTL FILTER W/RAM 132 QFP NSC/MM9248/EL8/VF8	2
014	R2,R3,R5,R19,R26, R35,R36,R37,R38,R40, R45,R46,R48,	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	13
015	R14,R15,R16,R27,R29, R30,R31,R32,R33,R42, R43,R44,R47,	RB2103-00	RES,10K OHM 2% 1/4W MTL FLM GVG/A70-RB2103-00 A1	13
087	R17	RB2111-00	RES,110 OHM 2% 1/4W MTL FLM GVG/A70-RB2111-00 A1	1
016	R1,R4,R8,R20,R21, R22,R24,R25,R34, R39,R41,R49,	RB2131-00	RES,130 OHM 2% 1/4W MTL FLM GVG/A70-RB2131-00 A1	12
085	R23,R28,	RB2201-00	RES,200 OHM 2% 1/4W MTL FLM GVG/A70-RB2201-00 A1	2
017	R6,R7,R9,R10,R11, R12,R13,R18,R50,	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	9
018	RN7,	RN0044-00	RES NTWK,4.7K OHM 9 RES 10 SIP AB/710A472	1
019	RN1,RN2,RN3,RN4,RN5, RN6,RN8,	RN0190-00	RES NTWK,33 OHM 5 RES 10 SIP BOR/4610X-102-330	7
080		SA1401-01	SCRW,MACH 2-56X.625 PH PNHD W/NYL FFT/MACH 2-56X.625 PH PNHD SST W/NL	4
021	U2803,	SC0215-00	IC,TTL 74LS74AN 14 DIP 74LS74AN	1
020	U1404,	SC0939-00	IC,CMOS TMC2011B2C 24 DIP GVG/A70-SC0939-00 A3	1
026	U2006 054300-00 U2007 054301-00	SC1246-00	IC,PAL GAL16V8A-25PL 20 DIP AMD/PALCE16V8H-25PC/4	6

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D
ASSEMBLY NUMBER: 064741-00 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
026	U2008 054327-00 U2302 054303-00 U2402 054278-00 U2801 054304-00	SC1246-00	CONTINUED FROM PREVIOUS PAGE AMD/PALCE16V8H-25PC/4	
027	U1910	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	1
088	U3203	SC1451-00	IC,ACMOS 74AC14 14 DIP GVG/A70-SC1451-00 A2	1
028	U3012,U3211,	SC1461-00	IC,ACMOS 74AC573 20 DIP GVG/A70-SC1461-00 A2	2
029	U3210,U3310,U1405, U1606,	SC1462-00	IC,ACMOS 74AC574 20 DIP GVG/A70-SC1462-00 A2	4
030	U2301,	SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC NSC/SCX6244UEC/V2	1
031	U2911,	SC1609-00	IC,ACMOS 74AC139 16 DIP GVG/A70-SC1609-00 A2	1
032	U2710,	SC1644-00	IC,ACMOS 74ACT377PC 20 DIP NSC/74ACT377PC	1
033	U2712 054305-00	SC1683-00	IC,MEM XC1736 8 DIP GVG/A70-SC1683-00 A2	1
034	U2711,	SC1712-00	IC,ACMOS 74ACT00 14 DIP GVG/A70-SC1712-00 A2	1
035	U0213,U0214,U0313, U0314,U0613,U0614, U0713,U0714,U0911, U0914,U1011,U1014, U1411,U1414, U1511,U1514, U1711,U2004,U2005, U2009,U2406,U2411, U2810,U2912,U3101, U3201,U3202,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	27
036	U0912,U0913,U1012, U1013,U1412,U1413, U1512,U1513,	SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	8
037	U3010,U3206,	SC1723-00	IC,ACMOS 74ACT541 20 DIP GVG/A70-SC1723-00 A2	2
038	U2606,U2811,	SC1724-00	IC,ACMOS 74ACT174 16 DIP GVG/A70-SC1724-00 A1	2
039	U2011,	SC1725-00	IC,ACMOS 74ACT175 16 DIP GVG/A70-SC1725-00 A1	1
040	U0211,U0212,U0311, U0312,U0611,U0612, U0711,U0712,	SC1730-00	IC,ACMOS 74ACT823 24 DIP GVG/A70-SC1730-00 A2	8
041	U2202,	SC1737-00	IC,UP-TMS320C10FNL25 44 PLCC GVG/A70-SC1737-00 A1	1
042	U2209,U2509,	SC1738-00	IC,MEM 7130SA55 52 PLCC CYP/CY7C131-55JC	2
043	U2502,U2604,U2702,	SC1741-00	IC,MEM IDT7132SA55J 52 PLCC CYP/CY7C136-55JC	3

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D
ASSEMBLY NUMBER: 064741-00 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
044	U0109,U0409,U0509, U0909,U1109,U1409, U2211,U2405,U2511,	SC1818-00	IC,ASIC 12 BIT MIXER 84 PLCC VLS/VF4730	9
046	U1609 054309-00 U1715 054310-00 U1903 054311-00 U2312 054312-00 U2612 054313-00 U2812 054314-00 U3003 054315-00 U3311 054287-00 U0309 054259-00 U0315 054307-00 U0709 054258-00 U0809 054261-00 U1309 054260-00 U1608 054308-00 U1904 054306-00	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	15
047	U1406,U2111,U2206, U2910,	SC1841-00	IC,CMOS L29C520PC-1 24 DIP GVG/A70-SC1841-00 A2	4
048	U1201,U1203,U1206, U1401,U1403,U1601, U2001,U2205,U3002,	SC1884-00	IC,ASIC 16 BIT NAM/ADD/MPY 68 PLCC NSC/MM9209/V4	9
051	U2707 054281-00 U2807 054280-00	SC1992-00	IC,MEM WS57C43B-35S 24 DIP .3 AMD/AM27C43T-35DC	2
052	U1713 054273-00 U1714 054276-00 U2012 054316-01	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	3
053	U3111,	SC1994-00	IC,ACMOS 74AC174 16 DIP NSC/74AC174PC	1
054	U0415,U0815,U1015, U1515,U3007,	SC2060-00	IC,ASIC DGTL 4 LN DLY/ADDS 84 PLCC NSC/MM9249	5
055	U2112,U2412,	SC2078-00	IC,ASIC DGTL FILTER W/RAM 84 PLCC NSC/MM9248/V5	2
081	U1604,U1605,U1811, U1911,U3312,	SC2142-00	IC,ACMOS 74ACQ244 20 DIP NSC/74ACQ244PC	5
082	U3112,U3212,	SC2143-00	IC,ACMOS 74ACQ543 24 DIP NSC/74ACQ543SPC	2
058	U0215,U1712,	SC7001-00	IC,ASIC S38BC017PM01 52 PLCC MOT/S38BC017PM01	2
059	U1602,U2201,	SC7004-00	IC,ASIC CLIP & GAIN 52 PLCC VLS/VF4709-52PLCC	2
060	OK TO USE SC1883-00 U2309,U2501,U2701,	SC7014-00	IC,ASIC 12 BIT MPY/NAM/ADD 52 PLCC NSC/MM9209/V3	3
069	U1910,U2711,U2803, U3203,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	4
070	U2011,U2606,U2811, U2911,U3111,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	5
075	U2712,	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	1

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D
ASSEMBLY NUMBER: 064741-00 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
072	U0213,U0214,U0313,U0314,U0613,U0614,U0713,U0714,U0911,U0914,U1011,U1014,U1405,U1411,U1414,U1511,U1514,U1604,U1605,U1606,U1711,U1811,U1911,U2004,U2005,U2006,U2007,U2008,U2009,U2302,U2402,U2406,U2411,U2710,U2801,U2810,U2912,U3010,U3012,U3101,U3201,U3202,U3206,U3210,U3211,U3310,U3312,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	47
071	U0211,U0212,U0309,U0311,U0312,U0315,U0611,U0612,U0709,U0711,U0712,U0809,U0912,U0913,U1012,U1013,U1309,U1404,U1406,U1412,U1413,U1512,U1513,U1607,U1608,U1609,U1713,U1714,U1715,U1903,U1904,U2012,U2111,U2206,U2312,U2612,U2707,U2807,U2812,U2910,U3003,U3112,U3212,U3311,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	44
073	U2301,U2202,	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK AMP/3-821688-1	2
177	ECO# Z333 U1201,U1203,U1206,U1401,U1403,U1601,U2001,U2205,U3002,	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK AMP/3-821689-3	9
077	U1201,U1203,U1206,U1401,U1403,U1601,U2001,U2205,U3002,	SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY BUR/QILE68P-410T	9
076	U0215,U1602,U1712,U2201,U2209,U2309,U2501,U2502,U2509,U2604,U2701,U2702,	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	12
174	ECO# Z333 U0109,U0409,U0415,U0509,U0815,U0909,U1015,U1109,U1409,U1515,U2112,U2211,U2405,U2412,U2511,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	16

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D
ASSEMBLY NUMBER: 064741-00 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
174	U3007,	SE8150-00	CONTINUED FROM PREVIOUS PAGE AMP/3-821690-3	
074	U0109,U0409,U0415, U0509,U0815,U0909, U1015,U1109,U1409, U1515,U2112,U2211, U2405,U2412,U2511, U3007,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	16
067	U0615,U1315,	SE8194-00	SKT,IC 132 PQFP 1.340X.950 FP AMP/821949-5	2
068	U0615,U1315,	SE8195-00	SKT,IC CVR 132 PQFP AMP/821942-1	2
061	TP1,TP2,TP3,TP4,TP5, TP6,TP7,TP8,TP9, TP10,TP11,TP12,TP13, TP14,TP15,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	15
062	FB1,FB2,	ZB4131-00	INDCTR,FERRITE BEAD 131 OHM@100MHZ FPC/2643021801	2

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D PAL
ASSEMBLY NUMBER: 064741-10 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D10,D45	000000-00	REFERENCE DOCUMENTS	0
024		024700-00	BAR,MODULE SUPPORT	1
025		024701-00	STIFFENER,PC BOARD FRONT DPM-100	1
201		044741-01	PCB,MULTISTANDARD 3D VID CHNL	1
023		064731-10	BRD,VIDEO RAM MEZZANINE PAL	16
100		064742-10	BRD,3D RAG PAL	1
101		064743-10	BRD,FILTER CONTROL MEZZANINE PAL	1
002	C1,C2,C3,C4,C5,C6, C7,C8,C9,C10,C11, C12,C13,C14,C16,C17, C18,C19,C20,C22,C23, C24,C25,C26,C27,C28, C29,C30,C31,C32,C33, C34,C35,C36,C37,C38, C39,C40,C41,C42,C43, C44,C45,C46,C47,C48, C49,C50,C51,C52,C53, C54,C55,C56,C57,C58, C59,C60,C61,C62,C63, C64,C65,C66,C67,C68, C69,C70,C72,C73,C74, C75,C76,C77,C78,C79, C80,C81,C82,C83,C84, C85,C86,C87,C88,C89, C90,C91,C92,C93,C94, C95,C96,C97,C98,C99, C100,C101,C102,C103, C104,C105,C106,C107, C108,C109,C110,C111, C112,C113,C114,C115, C116,C117,C118,C119, C120,C122,C123,C124, C125,C126,C127,C128, C129,C130,C132,C133, C134,C135,C136,C137, C138,C139,C140,C141, C142,C143,C144,C145, C146,C147,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	142
003	C15,C21,	CB2205-00	CAP,MICA D10 10PF 5% 500WV COD/CD10CD100J03	2
090	C148	CB2209-00	CAP,MICA D10 20PF 5% 500WV COD/CD10ED200J03	1
085	C131	CB2252-00	CAP,MICA D10 1000PF 5% 100WV	1

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D PAL
ASSEMBLY NUMBER: 064741-10 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			COD/D101F102J03	
004	C121,	CB4022-00	CAP,TANT 22UF 10% 15WV GVG/A70-CB4022-00 A1	1
005	EJ1,EJ2,	CC2073-00	CARD EJCTR,NYL BLK .062 THK PCB CAK/107-20	2
006	J4,J7,J8,J9,J10,J11, J12,J13,J14,J15,J16, J17,J18,J19,J36,J38, J39,J41,	CF0676-10	CONN,PL HDR 10POS 1ROW PCB MNT DCS/65507-110	18
007	J1,J3,	CF1039-00	CONN,PL 96POS 3ROW RTANG PAN ONLY GVG/A70-CF1039-00 A1	2
008	J20,J21,J22,J23,J24, J25,J26,J27,J28,J29, J30,J31,J32,J33,J34, J35,	CF1067-02	CONN,PL 80POS 1ROW SIMM TIN PLT BUR/SIME80PSB2	16
009	J5,J6,J37,J40,	CF1720-00	CONN,PL HDR 56POS 2ROW VERT PCB MNT AMP/2-103186-8	4
010	J2,	CF1883-00	CONN,PL 96POS 3ROW RTANG PCB 5KEYED PAN/100-096-2007	1
011	Y1,	CJ2025-00	CRYSTAL,24MHZ CTK/MP240	1
013	U0615,U1315,	QS1184-00	IC,ASIC DGTL FILTER W/RAM 132 QFP NSC/MM9248/EL8/VF8	2
014	R2,R3,R5,R19,R26, R35,R36,R37,R38,R40, R45,R46,R48,	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	13
015	R14,R15,R16,R27,R29, R30,R31,R32,R33,R42, R43,R44,R47,	RB2103-00	RES,10K OHM 2% 1/4W MTL FLM GVG/A70-RB2103-00 A1	13
086	R17	RB2111-00	RES,110 OHM 2% 1/4W MTL FLM GVG/A70-RB2111-00 A1	1
016	R1,R4,R8,R20,R21, R22,R24,R25,R34,R39, R41,R49,	RB2131-00	RES,130 OHM 2% 1/4W MTL FLM GVG/A70-RB2131-00 A1	12
087	R23,R28,	RB2201-00	RES,200 OHM 2% 1/4W MTL FLM GVG/A70-RB2201-00 A1	2
017	R6,R7,R9,R10,R11, R12,R13,R18,R50,	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	9
018	RN7,	RN0044-00	RES NTWK,4.7K OHM 9 RES 10 SIP AB/710A472	1
019	RN1,RN2,RN3,RN4,RN5, RN6,RN8,	RN0190-00	RES NTWK,33 OHM 5 RES 10 SIP BOR/4610X-102-330	7
080		SA1401-01	SCRW,MACH 2-56X.625 PH PNHD W/NYL FFT/MACH 2-56X.625 PH PNHD SST W/NL	4
021	U2803,	SC0215-00	IC,TTL 74LS74AN 14 DIP 74LS74AN	1
020	U1404,	SC0939-00	IC,CMOS TMC2011B2C 24 DIP GVG/A70-SC0939-00 A3	1
022	U1607 054257-00	SC0966-00	IC,MEM CY7C291A-35PC 24 DIP CYP/CY7C291A-35PC	1

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D PAL
ASSEMBLY NUMBER: 064741-10 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
026	U2006 054300-00 U2007 054301-00 U2008 054302-00 U2302 054303-00 U2402 054278-00	SC1246-00	IC,PAL GAL16V8A-25PL 20 DIP AMD/PALCE16V8H-25PC/4	5
088	U2801 054304-00	SC1246-01	IC,PAL GAL16V8A-10LP 20 DIP LAT/GAL16V8A-10LP	1
027	U1910,U3203	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	2
028	U3012,U3211,	SC1461-00	IC,ACMOS 74AC573 20 DIP GVG/A70-SC1461-00 A2	2
029	U3210,U3310,U1405, U1606,	SC1462-00	IC,ACMOS 74AC574 20 DIP GVG/A70-SC1462-00 A2	4
030	U2301,	SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC NSC/SCX6244UEC/V2	1
031	U2911,	SC1609-00	IC,ACMOS 74AC139 16 DIP GVG/A70-SC1609-00 A2	1
032	U2710,	SC1644-00	IC,ACMOS 74ACT377PC 20 DIP NSC/74ACT377PC	1
033	U2712 054305-00	SC1683-00	IC,MEM XC1736 8 DIP GVG/A70-SC1683-00 A2	1
034	U2711,	SC1712-00	IC,ACMOS 74ACT00 14 DIP GVG/A70-SC1712-00 A2	1
035	U0213,U0214,U0313, U0314,U0613,U0614, U0713,U0714,U0911, U0914,U1011,U1014, U1411,U1414, U1511,U1514, U1711,U2004,U2005, U2009,U2406,U2411, U2810,U2912,U3101, U3201,U3202,	SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	27
036	U0912,U0913,U1012, U1013,U1412,U1413, U1512,U1513,	SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	8
037	U3010,U3206,	SC1723-00	IC,ACMOS 74ACT541 20 DIP GVG/A70-SC1723-00 A2	2
038	U2606,U2811,	SC1724-00	IC,ACMOS 74ACT174 16 DIP GVG/A70-SC1724-00 A1	2
039	U2011,	SC1725-00	IC,ACMOS 74ACT175 16 DIP GVG/A70-SC1725-00 A1	1
040	U0211,U0212,U0311, U0312,U0611,U0612, U0711,U0712,	SC1730-00	IC,ACMOS 74ACT823 24 DIP GVG/A70-SC1730-00 A2	8
041	U2202,	SC1737-00	IC,UP TMS320C10FNL25 44 PLCC GVG/A70-SC1737-00 A1	1
042	U2209,U2509,	SC1738-00	IC,MEM 7130SA55 52 PLCC CYP/CY7C131-55JC	2
043	U2502,U2604,U2702,	SC1741-00	IC,MEM IDT7132SA55J 52 PLCC	3

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D PAL
ASSEMBLY NUMBER: 064741-10 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			CYP/CY7C136-55JC	
044	U0109,U0409,U0509, U0909,U1109,U1409, U2211,U2405,U2511,	SC1818-00	IC,ASIC 12 BIT MIXER 84 PLCC VLS/VF4730	9
046	U1609 054309-00 U1715 054310-00 U1903 054311-00 U2312 054312-00 U2612 054313-00 U2812 054314-00 U3003 054315-00 U3311 054287-00 U0309 054259-00 U0315 054307-00 U0709 054258-00 U0809 054261-00 U1309 054260-00 U1608 054308-00 U1904 054306-00	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	15
047	U1406,U2111,U2206, U2910,	SC1841-00	IC,CMOS L29C520PC-1 24 DIP GVG/A70-SC1841-00 A2	4
048	U1201,U1203,U1206, U1401,U1403,U1601, U2001,U2205,U3002,	SC1884-00	IC,ASIC 16 BIT NAM/ADD/MPY 68 PLCC NSC/MM9209/V4	9
051	U2707 054283-00 U2807 054282-00	SC1992-00	IC,MEM WS57C43B-35S 24 DIP .3 AMD/AM27C43T-35DC	2
052	U1713 054274-00 U1714 054277-00 U2012 054316-01	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	3
053	U3111,	SC1994-00	IC,ACMOS 74AC174 16 DIP NSC/74AC174PC	1
054	U0415,U0815,U1015, U1515,U3007,	SC2060-00	IC,ASIC DGTL 4 LN DLY/ADDS 84 PLCC NSC/MM9249	5
055	U2112,U2412,	SC2078-00	IC,ASIC DGTL FILTER W/RAM 84 PLCC NSC/MM9248/V5	2
081	U1604,U1605,U1811, U1911,U3312,	SC2142-00	IC,ACMOS 74ACQ244 20 DIP NSC/74ACQ244PC	5
082	U3112,U3212,	SC2143-00	IC,ACMOS 74ACQ543 24 DIP NSC/74ACQ543SPC	2
058	U0215,U1712,	SC7001-00	IC,ASIC S38BC017PM01 52 PLCC MOT/S38BC017PM01	2
059	U1602,U2201,	SC7004-00	IC,ASIC CLIP & GAIN 52 PLCC VLS/VF4709-52PLCC	2
060	OK TO USE SC1883-00 U2309,U2501,U2701,	SC7014-00	IC,ASIC 12 BIT MPY/NAM/ADD 52 PLCC NSC/MM9209/V3	3
069	U1910,U2711,U2803, U3203,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	4
070	U2011,U2606,U2811, U2911,U3111,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	5
075	U2712,	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG	1

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D PAL
ASSEMBLY NUMBER: 064741-10 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			AMP/2-640463-3	
072	U0213,U0214,U0313, U0314,U0613,U0614, U0713,U0714,U0911, U0914,U1011,U1014, U1405,U1411,U1414, U1511,U1514,U1604, U1605,U1606,U1711, U1811,U1911,U2004, U2005,U2006,U2007, U2008,U2009,U2302, U2402,U2406,U2411, U2710,U2801,U2810, U2912,U3010,U3012, U3101,U3201,U3202, U3206,U3210,U3211, U3310,U3312,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	47
071	U0211,U0212,U0309, U0311,U0312,U0315, U0611,U0612,U0709, U0711,U0712,U0809, U0912,U0913,U1012, U1013,U1309,U1404, U1406,U1412,U1413, U1512,U1513,U1607, U1608,U1609,U1713, U1714,U1715,U1903, U1904,U2012,U2111, U2206,U2312,U2612, U2707,U2807,U2812, U2910,U3003,U3112, U3212,U3311,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	44
073	U2301,U2202,	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK AMP/3-821688-1	2
177	ECO# Z333 U1201,U1203,U1206, U1401,U1403,U1601, U2001,U2205,U3002,	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK AMP/3-821689-3	9
077	U1201,U1203,U1206, U1401,U1403,U1601, U2001,U2205,U3002,	SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY BUR/QILE68P-410T	9
076	U0215,U1602,U1712, U2201,U2209,U2309, U2501,U2502,U2509, U2604,U2701,U2702,	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	12
174	ECO# Z333 U0109,U0409,U0415, U0509,U0815,U0909, U1015,U1109,U1409, U1515,U2112,U2211,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	16

REPLACEMENT PARTS LIST

BRD,MULTISTD VID CHNNL 3D PAL
ASSEMBLY NUMBER: 064741-10 ISSUE: C ECN: Z407

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
174	U2405,U2412,U2511, U3007,	SE8150-00	CONTINUED FROM PREVIOUS PAGE AMP/3-821690-3	
074	U0109,U0409,U0415, U0509,U0815,U0909, U1015,U1109,U1409, U1515,U2112,U2211, U2405,U2412,U2511, U3007,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	16
067	U0615,U1315,	SE8194-00	SKT,IC 132 PQFP 1.340X.950 FP AMP/821949-5	2
068	U0615,U1315,	SE8195-00	SKT,IC CVR 132 PQFP AMP/821942-1	2
061	TP1,TP2,TP3,TP4,TP5, TP6,TP7,TP8,TP9, TP10,TP11,TP12,TP13, TP14,TP15,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	15
062	FB1,FB2,	ZB4131-00	INDCTR,FERRITE BEAD 131 OHM@100MHZ FPC/2643021801	2

REPLACEMENT PARTS LIST

BRD,3D RAG
ASSEMBLY NUMBER: 064742-00 ISSUE: A ECN: Z401

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	X2 FAB	044742-00	PCB,3D RAG	1
002	C1,C18,C20,C21,	CB0106-00	CAP,CER 1000PF 10% 50WV X7R AVX/SR155C102KAA	4
003	C2,C3,C4,C5, C6,C7,C8,C9,C10, C11,C12,C13,C14,C15, C16,C17,C19,C22,C23,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	19
004	J1,J2,	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
040	R1	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	1
005	R5	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	1
006	R2,R3,R4,	RV7509-00	RES,75 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 75 OHM 1%	3
036		SA1053-01	SCRW,MACH 4-40X.25L PH PNH W/NYL MACH 4-40X.25L PH PNH W/NYL ZINC	8
007	U63	SC1451-00	IC,ACMOS 74AC14 14 DIP GVG/A70-SC1451-00 A2	1
012	U54	SC1459-00	IC,ACMOS 74AC175 16 DIP GVG/A70-SC1459-00 A2	1
008	U62	SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC NSC/SCX6244UEC/V2	1
009	U61,U81,U83,	SC1680-00	IC,ASIC ITERATIVE ADDER 84 PLCC LSI/L1A5048	3
010	U12 054317-00 U22 054317-00	SC1683-00	IC,MEM XC1736 8 DIP GVG/A70-SC1683-00 A2	2
011	U71,	SC1724-00	IC,ACMOS 74ACT174 16 DIP GVG/A70-SC1724-00 A1	1
013	U74 054318-00	SC1822-00	IC,PAL 20V8 24 DIP 25NS AMD/PALCE20V8H-25	1
014	U11,U13,	SC1884-00	IC,ASIC 16 BIT NAM/ADD/MPY 68 PLCC NSC/MM9209/V4	2
015	U84 054319-00	SC1946-00	IC,UP AM29CPL154H-25DC 28 DIP AMD/AM29CPL154H-25DC	1
016	U41,U43,	SC2100-00	IC,DGTL TMC3211H5C 121 PGA TRW/TMC3211H5C	2
017	U31,U33,	SC2101-00	IC,PGA XC3030-70PC84C 84 PLCC XIL/XC3030-70PC84C	2
019	U44,	SC2142-00	IC,ACMOS 74ACQ244 20 DIP NSC/74ACQ244PC	1
018	U72,	SC7014-00	IC,ASIC 12 BIT MPY/NAM/ADD 52 PLCC NSC/MM9209/V3	1
023	U63	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	1
024	U54,U71,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	2
025	U12,U22,	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	2

REPLACEMENT PARTS LIST

BRD,3D RAG
ASSEMBLY NUMBER: 064742-00 ISSUE: A ECN: Z401

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
026	U44,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	1
027	U74,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	1
030	U62,	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK AMP/3-821688-1	1
129	ECO# Z333 U11,U13,	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK AMP/3-821689-3	2
029	U11,U13,	SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY BUR/QILE68P-410T	2
031	U72,	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	1
121	ECO# Z333 U31,U33,U61,U81,U83,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	5
021	U31,U33,U61,U81,U83	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	5
020	U41,U43,	SE8167-00	SKT,IC 121 PGA 13X13 LIF AMP/55273-2	2
035		SF2003-00	SPCR,4-40 .25 HEX .375L BRS ZINC GVG/A70-SF2003-00 A1	4
022	TP1,TP2,TP3,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	3

REPLACEMENT PARTS LIST

BRD,3D RAG PAL
ASSEMBLY NUMBER: 064742-10   ISSUE: A   ECN: Z406

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	X2 FAB	044742-00	PCB,3D RAG	1
002	C1,C18,C22,C23,	CB0106-00	CAP,CER 1000PF 10% 50WV X7R AVX/SR155C102KAA	4
003	C2,C3,C4,C5,C6,C7, C8,C9,C10,C11,C12, C13,C14,C15,C16,C17, C19,C22,C23,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	19
004	J1,J2,	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
040	R1	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	1
005	R5	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	1
006	R2,R3,R4,	RV7509-00	RES,75 OHM 1% 1/8W MTL FLM DAL/CMF-55 T-1 75 OHM 1%	3
036		SA1053-01	SCRW,MACH 4-40X.25L PH PNH W/NYL MACH 4-40X.25L PH PNH W/NYL ZINC	8
007	U63	SC1451-00	IC,ACMOS 74AC14 14 DIP GVG/A70-SC1451-00 A2	1
012	U54	SC1459-00	IC,ACMOS 74AC175 16 DIP GVG/A70-SC1459-00 A2	1
008	U62	SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC NSC/SCX6244UEC/V2	1
009	U61,U81,U83,	SC1680-00	IC,ASIC ITERATIVE ADDER 84 PLCC LSI/L1A5048	3
010	U12 054317-00 U22 054317-00	SC1683-00	IC,MEM XC1736 8 DIP GVG/A70-SC1683-00 A2	2
011	U71	SC1724-00	IC,ACMOS 74ACT174 16 DIP GVG/A70-SC1724-00 A1	1
013	U74 054318-00	SC1822-00	IC,PAL 20V8 24 DIP 25NS AMD/PALCE20V8H-25	1
014	U11,U13,	SC1884-00	IC,ASIC 16 BIT NAM/ADD/MPY 68 PLCC NSC/MM9209/V4	2
015	U84 054328-00	SC1946-00	IC,UP AM29CPL154H-25DC 28 DIP AMD/AM29CPL154H-25DC	1
016	U41,U43,	SC2100-00	IC,DGTL TMC3211H5C 121 PGA TRW/TMC3211H5C	2
017	U31,U33,	SC2101-00	IC,PGA XC3030-70PC84C 84 PLCC XIL/XC3030-70PC84C	2
019	U44	SC2142-00	IC,ACMOS 74ACQ244 20 DIP NSC/74ACQ244PC	1
018	U72	SC7014-00	IC,ASIC 12 BIT MPY/NAM/ADD 52 PLCC NSC/MM9209/V3	1
023	U63,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	1
024	U54,U71,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	2
025	U12,U22,	SE8021-05	SKT,IC 8 DIP .3 CB BLK STR LEG AMP/2-640463-3	2

REPLACEMENT PARTS LIST

BRD,3D RAG PAL
ASSEMBLY NUMBER: 064742-10 ISSUE: A ECN: Z406

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
026	U44,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	1
027	U74,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	1
030	U62	SE8051-00	SKT,IC 44 PLCC .9 SQ BLK AMP/3-821688-1	1
129	ECO# Z333 U11,U13,	SE8063-00	SKT,IC 68 LCC 1.2 SQ BLK AMP/3-821689-3	2
029	U11,U13,	SE8063-01	SKT,IC 68 PLCC 1.2SQ BUR ONLY BUR/QILE68P-410T	2
031	U72	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	1
121	ECO# Z333 U31,U33,U61,U81,U83,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	5
021	U31,U33,U61,U81,U83,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	5
028	U84	SE8166-00	SKT,IC 28 DIP .3 CB BLK BUR/DILB28SP-8JKT	1
020	U41,U43,	SE8167-00	SKT,IC 121 PGA 13X13 LIF AMP/55273-2	2
035		SF2003-00	SPCR,4-40 .25 HEX .375L BRS ZINC GVG/A70-SF2003-00 A1	4
022	TP1,TP2,TP3,	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	3

REPLACEMENT PARTS LIST

BRD,FILTER CONTROL MEZZANINE
ASSEMBLY NUMBER: 064743-00 ISSUE: A ECN: Z401

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	X2 FAB	044743-00	PCB,FILTER CONTROL MEZZANINE	1
002	C1,C2,C3,C4,C5,C6, C7,C8,C9,C10,C11, C12,C13,C14,C15,C16, C17,C18,C19,C20,C21, C22,C23,C24,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	24
003	J1,J2,	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
004	R12,R13,	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	2
005	R1,R2,R3,R4,R5,R6, R7,R8,R9,R10,	RB2103-00	RES,10K OHM 2% 1/4W MTL FLM GVG/A70-RB2103-00 A1	10
006	R11,R14,R16,	RB2131-00	RES,130 OHM 2% 1/4W MTL FLM GVG/A70-RB2131-00 A1	3
080	R15	RB2241-00	RES,240 OHM 2% 1/4W MTL FLM GVG/A70-RB2241-00 A1	1
029	R17,	RB2470-00	RES,47 OHM 2% 1/4W MTL FLM GVG/A70-RB2470-00 A1	1
028		SA1053-01	SCRW,MACH 4-40X.25L PH PNH W/NYL MACH 4-40X.25L PH PNH W/NYL ZINC	8
007	U0501,	SC0939-00	IC,CMOS TMC2011B2C 24 DIP GVG/A70-SC0939-00 A3	1
008	U0703 054320-00 U0705 054320-00 U0901 054321-00	SC1246-00	IC,PAL GAL16V8A-25PL 20 DIP AMD/PALCE16V8H-25PC/4	3
009	U1102,	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	1
010	U0801,U0804,U1004,	SC1680-00	IC,ASIC ITERATIVE ADDER 84 PLCC LSI/L1A5048	3
011	U1101,	SC1725-00	IC,ACMOS 74ACT175 16 DIP GVG/A70-SC1725-00 A1	1
012	U0101 054322-00 U0601 054322-00 U0201 054323-00 U0401 054323-00	SC1822-00	IC,PAL 20V8 24 DIP 25NS AMD/PALCE20V8H-25	4
013	U0702 054324-00 U0704 054324-00	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	2
014	U0301,	SC1841-00	IC,CMOS L29C520PC-1 24 DIP GVG/A70-SC1841-00 A2	1
015	U1001 054325-00	SC1946-00	IC,UP AM29CPL154H-25DC 28 DIP AMD/AM29CPL154H-25DC	1
019	U0701 054326-00	SC2011-00	IC,MEM CY7C245A-25PC 24 DIP CYP/CY7C245A-25PC	1
018	U0902,	SC2142-00	IC,ACMOS 74ACQ244 20 DIP NSC/74ACQ244PC	1
016	U0203,U0204,U0403, U0404,	SC7014-00	IC,ASIC 12 BIT MPY/NAM/ADD 52 PLCC NSC/MM9209/V3	4
020	U1102,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	1

REPLACEMENT PARTS LIST

BRD,FILTER CONTROL MEZZANINE
ASSEMBLY NUMBER: 064743-00 ISSUE: A ECN: Z401

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
021	U1101,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	1
022	U0703,U0705,U0901, U0902,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	4
023	U0101,U0201,U0301, U0401,U0501,U0601, U0701,U0702,U0704,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	9
026	U0203,U0204,U0403, U0404,	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	4
125	ECO# Z333 U0801,U0804,U1004,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	3
025	U0801,U0804,U1004,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	3
024	U1001,	SE8166-00	SKT,IC 28 DIP .3 CB BLK BUR/DILB28SP-8JKT	1
027		SF2003-00	SPCR,4-40 .25 HEX .375L BRS ZINC GVG/A70-SF2003-00 A1	4
017	TP1,TP2,TP3,TP4,TP5	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	5

REPLACEMENT PARTS LIST

BRD,FILTER CONTROL MEZZANINE PAL
ASSEMBLY NUMBER: 064743-10 ISSUE: A ECN: Z406

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	X2 FAB	044743-00	PCB,FILTER CONTROL MEZZANINE	1
002	C1,C2,C3,C4,C5,C6, C7,C8,C9,C10,C11, C12,C13,C14,C15,C16, C17,C18,C19,C20,C21, C22,C23,C24,	CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL MUR/SL105E103MAA	24
003	J1,J2,	CF1719-00	CONN,RCPT 56POS 2ROW VERT PCB MNT AMP/2-534998-8	2
004	R12,R13,	RB2101-00	RES,100 OHM 2% 1/4W MTL FLM GVG/A70-RB2101-00 A1	2
005	R1,R2,R3,R4,R5,R6, R7,R8,R9,R10,	RB2103-00	RES,10K OHM 2% 1/4W MTL FLM GVG/A70-RB2103-00 A1	10
006	R11,R14,R16,	RB2131-00	RES,130 OHM 2% 1/4W MTL FLM GVG/A70-RB2131-00 A1	3
080	R15	RB2241-00	RES,240 OHM 2% 1/4W MTL FLM GVG/A70-RB2241-00 A1	1
028		SA1053-01	SCRW,MACH 4-40X.25L PH PNH W/NYL MACH 4-40X.25L PH PNH W/NYL ZINC	8
007	U0501,	SC0939-00	IC,CMOS TMC2011B2C 24 DIP GVG/A70-SC0939-00 A3	1
008	U0703 054320-00 U0705 054320-00 U0901 054321-00	SC1246-00	IC,PAL GAL16V8A-25PL 20 DIP AMD/PALCE16V8H-25PC/4	3
009	U1102,	SC1443-00	IC,ACMOS 74AC04 14 DIP GVG/A70-SC1443-00 A2	1
010	U0801,U0804,U1004,	SC1680-00	IC,ASIC ITERATIVE ADDER 84 PLCC LSI/L1A5048	3
011	U1101,	SC1725-00	IC,ACMOS 74ACT175 16 DIP GVG/A70-SC1725-00 A1	1
012	U0101 054322-00 U0601 054322-00 U0201 054323-00 U0401 054323-00	SC1822-00	IC,PAL 20V8 24 DIP 25NS AMD/PALCE20V8H-25	4
013	U0702 054324-00 U0704 054324-00	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	2
014	U0301,	SC1841-00	IC,CMOS L29C520PC-1 24 DIP GVG/A70-SC1841-00 A2	1
015	U1001 054325-00	SC1946-00	IC,UP AM29CPL154H-25DC 28 DIP AMD/AM29CPL154H-25DC	1
019	U0701 054326-00	SC2011-00	IC,MEM CY7C245A-25PC 24 DIP CYP/CY7C245A-25PC	1
018	U0902,	SC2142-00	IC,ACMOS 74ACQ244 20 DIP NSC/74ACQ244PC	1
016	U0203,U0204,U0403, U0404,	SC7014-00	IC,ASIC 12 BIT MPY/NAM/ADD 52 PLCC NSC/MM9209/V3	4
020	U1102,	SE8006-05	SKT,IC 14 DIP .3 CB BLK STR LEG AMP/2-640357-3	1
021	U1101,	SE8011-05	SKT,IC 16 DIP .3 CB BLK STR LEG AMP/2-640358-3	1

REPLACEMENT PARTS LIST

BRD,FILTER CONTROL MEZZANINE PAL
ASSEMBLY NUMBER: 064743-10 ISSUE: A ECN: Z406

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
022	U0703,U0705,U0901, U0902,	SE8034-05	SKT,IC 20 DIP .3 CB BLK STR LEG AMP/2-640464-3	4
023	U0101,U0201,U0301, U0401,U0501,U0601, U0701,U0702,U0704,	SE8043-05	SKT,IC 24 DIP .3 CB BLK STR LEG AMP/2-641932-3	9
026	U0203,U0204,U0403, U0404,	SE8094-03	SKT,IC 52 PLCC AMP/3-821739-3	4
125	ECO# Z333 U0801,U0804,U1004,	SE8150-00	SKT,IC 84 PLCC 1.4 SQ AMP/3-821690-3	3
025	U0801,U0804,U1004,	SE8150-01	SKT,IC 84 PLCC 1.4SQ BUR ONLY BUR/QILE84P-410T	3
024	U1001,	SE8166-00	SKT,IC 28 DIP .3 CB BLK BUR/DILB28SP-8JKT	1
027		SF2003-00	SPCR,4-40 .25 HEX .375L BRS ZINC GVG/A70-SF2003-00 A1	4
017	TP1,TP2,TP3,TP4,TP5	TA6151-00	TERM,TEST POINT YEL MOU/ME151A-202-1000	5

<< GVG - PSD >>

REPLACEMENT PARTS LIST

SUBASSY,LEVER ARM
ASSEMBLY NUMBER: 074704-00 ISSUE: A ECN: W608

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
012		025105-02	HANDLE,LEVER ASSY	1
014		025105-03	HANDLE,LEVER ASSY	1
030		027621-00	BRKT,LOCK LEVER ARM	1
006		027622-00	LEVER ARM,MDL 100	1
004		034712-00	PLATE,SIDE LEVER ARM	1
005		034712-01	PLATE,SIDE W/BUSHING LEVER ARM	1
010		037620-00	TUBE,STOP	2
008		037624-00	TUBE,FRICTION	4
016		PD0120-00	POT,5K OHM 20% 90 DEG THROW CLA/B70-PD0120-00	1
032		SA1031-00	SCRW,MACH 4-40X.4375L PH FILH MACH 4-40X.4375L PH FILH ZINC	2
022		SA1169-00	SCRW,MACH 10-32X1.5L HEX SKT FLH MACH 10-32X1.5L HEX SKT FLH BLK OXD	1
024		SA1200-00	SCRW,MACH 10-32X.375L HEX SKT FLH MACH 10-32X.375 HEX SKT FLH BLK OXD	1
028		SA1245-01	SCRW,MACH 4-40X.25L TORX SLT PNH NY MACH 4-40X.25L TX T10 SLT PNH W/NYL	4
018		SF6015-00	SPR,CPRSN .5LX.24X.180 OD MW GVG/A70-SF6015-00 A1	4
020		SH2047-00	STDF,4-40 .25 DIAX1.312L GVG/A70-SH2047-00 A1	2
034		WA2009-00	WSHR,#4 INTL STAR LOCK ZINC WASHER,#4,INT STAR,ZINC PL	2
026		WA2044-00	WSHR,#10 .580 ODX0.16 THK NYL GVG/A70-WA2044-00 A1	2

REPLACEMENT PARTS LIST

SUBASSY,JOY STICK POSITIONER
ASSEMBLY NUMBER: 074705-00 ISSUE: B ECN: Z274

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
003		CF1247-00	CONN,RCPT 4POS 1ROW TANDEM SPR AMP/87499-7	3
005		CF1274-00	CONN,SKT CNT 30-26 AWG REEL AMP/87313-8	9
007		CF1286-00	CONN,KEY PL NYL NAT AMP/87077-2	3
010	6 PIECES 1" LONG	HA9003-00	HEAT SHRNK TBG,.1875 CLR GVG/A70-HA9003-00 A1	1
001		PC4004-00	POSITIONER,JOYSTICK CNTRLR CHP/S30L081B MODEL 300B	1
009	6 PIECES 6" LONG	WB0038-00	WIRE,24 AWG 7X32 WHT 9 BEL/B24(7) WHITE	3

<< GVG - PSD >>

REPLACEMENT PARTS LIST

SUBASSY,PWR SPLY W/HARNESS 4RU
ASSEMBLY NUMBER: 074707-10 ISSUE: A ECN: Z311

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D06/11-074707-10	000000-00	REFERENCE DOCUMENTS	0
002		054708-10	CABLE ASSY,PWR SUP HARNESS,4RU HAE/D06-054708-10	1
004	2 EACH J4A	CF1775-00	CONN,SKT CNT 18-22 AWG AMP/170366-1	2
001		PE1198-00	PWR SPLY,115/230VAC 5 OUTPUTS 225W DET/11294XA	1

REPLACEMENT PARTS LIST

SUBASSY,KIT SPARE FUSE/LAMP/CONN
ASSEMBLY NUMBER: 074712-00 ISSUE: D ECN: Z335

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
015		CF0028-00	CONN,PL 9POS HDP-20 PNL MNT AMP/205204-1	1
010		CF0403-00	CONN,PL 9POS 2ROW AMP/747904-4	2
016		CF1045-00	CONN,HOOD 9POS D-SUB TTI/TT09N(G)	1
011		CF1580-00	CONN,HOOD & CBL CLMP 9POS #1 SHELL AMP/745171-1	2
012		CF1581-00	CONN,FERRULE SPLIT-RING AMP/745508-3	2
013	2 EA FOR REAR AC INPUT (180-260 VAC)	FB4011-00	FUSE,3 AG 2 AMP BUS/AGC-2	2
001	1 EA FOR REAR AC INPUT (90-130 VAC) 2 EA FOR FRONT ACCESS FUSES (-12V & 24V)	FB4013-00	FUSE,3 AG 4 AMP BUS/MTH-CW-4	3
002	FOR 064709 SWITCHES (MORE UNDER KEYPAD)	LA6062-00	LMP,CLR 5V@115MA SPARE TO SJ0230-00 ISD/2187601	15
003	FOR CONTROL PANEL (064709)	RA4024-00	RDOUT DSPL,LED DUAL .3 HGT RED GI/MAN74A	1
004	FOR CONTROL PANEL (064700/064710)	SB1018-00	DIODE,LED MV5453 GRN WIDE-BEAM GI/MV5453	1
005	FOR CONTROL PANEL (064709)	SB1051-00	DIODE,LED HLMP2885 GRN .350X.750 GVG/A70-SB1051-00 A2	1
006	FOR CONTROL PANEL (064709)	SB1052-00	DIODE,LED HMLP2855 FRN .350X.350-SQ GVG/A70-SB1052-00 A2	1

<<CORPORATE MANUFACTURING>>

REPLACEMENT PARTS LIST

SUBASSY,FRONT COVER FRAME 4RU
ASSEMBLY NUMBER: 074719-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
006	ADD L/6 10/16 :PC	054037-00	FRONT PLT,METAL 4RU	1
004		AA4006-00	ADH,VELCRO ARROWHD BLK 1WX25 YDS GVG/A70-AA4006-00 A2	0
005		FA6502-18	FLTR,AIR RFPU .5THK 20PPI 5.55X3.25 GVG/C21-FA6502-XX	1
003		HA1132-00	HDW,LATCH ADJ GRIP W/PAWL IND STH/16-10-412-14	2

REPLACEMENT PARTS LIST

SUBASSY,FAN FRAME 4RU
ASSEMBLY NUMBER: 074721-00 ISSUE: A ECN: Z116

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	C06-074721-00	000000-00	REFERENCE DOCUMENTS	0
001		004800-00	BRKT,FAN 4RU	1
002		CA8001-00	CBL TIE,NYL .625 MAX DIA NAT GVG/A70-CA8001-00 A2	1
003		CF1774-00	CONN,PL 2POS 1ROW FREE HNG AMP/172336-1	1
004		CF1776-00	CONN,PIN CNT 18-22 AWG AMP/170364-1	2
005		FA2050-00	FAN,12VDC 5.9W 4.73" 89 CFM IMC/4710NL-04W-B40-D00	2
006		SA1095-01	SCRW,MACH 6-32X.3125 PH PNH W/NYL MACH 6-32X.3125L PNH W/NYK ZINC	8

REPLACEMENT PARTS LIST

SUBASSY,MTHBD DPM-100
ASSEMBLY NUMBER: 074725-01 ISSUE: A ECN: Z392

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	C06	000000-00	REFERENCE DOCUMENTS	0
001		064716-01	BRD,DPM100 INT MTHBD	1
002		064717-01	BRD,DPM100 EXT MTHBD	1
003	J5,J26,J27,J28,J29, J30,J31,J32,	CF0980-00	CONN,STACKING 64POS W/2-56 INSERTS GVG/A70-CF0980-00 A3	8
004		SA1357-01	SCRW,CAP 2-56X.25 HEX SKT W/NYL FFT/2-56X.25L SKT CAP W/NYL	32

<< GVG - PSD >>

REPLACEMENT PARTS LIST

SUBASSY,LENS SET DPM-700
ASSEMBLY NUMBER: 074743-00 ISSUE: A ECN: Z425

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D31-074743-00	000000-00	REFERENCE DOCUMENTS	0
001		LB1106-00	LENS,CAP WHT .62X.62 PLT/D70-LB1106-00	70
002		LB1106-01	LENS,CAP ORG .62X.62 PLT/D70-LB1106-01	4
003		LB1106-02	LENS,CAP YEL .62X.62 PLT/D70-LB1106-02	4
004		LB1106-03	LENS,CAP BLK .62X.62 PLT/D70-LB1106-03	16

REPLACEMENT PARTS LIST

SYS,RECURSIVE MEM NTSC OPT
ASSEMBLY NUMBER: 084705-50 ISSUE: A ECN: Z283

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	MOUNTS ON 064700	064703-01	BRD,RECURSIVE MEMORY NTSC	1
002	MOUNTS ON 064703	064732-00	BRD,RECURSIVE MEMORY RAM MEZZANINE	3
005		SA1053-01	SCRW,MACH 4-40X.25L PH PNH W/NYL MACH 4-40X.25L PH PNH W/NYL ZINC	24
003		SF2005-00	SPCR,4-40 .25 HEX .5L BRS ZINC GVG/A70-SF2005-00 A2	12
004		SH2018-00	STDF,M/F 4-40 .250HEX .375L GVG/A70-SH2018-00 A1	4

REPLACEMENT PARTS LIST

SYS,RECURSIVE MEM PAL OPT
ASSEMBLY NUMBER: 084713-00 ISSUE: A ECN: Z201

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001	MOUNTS ON 064700	064703-10	BRD,RECURSIVE MEMORY PAL	1
002	MOUNTS ON 064703	064732-10	BRD,RECURSIVE MEM RAM MEZZANINE PAL	3
005		SA1053-01	SCRW,MACH 4-40X.25L PH PNH W/NYL MACH 4-40X.25L PH PNH W/NYL ZINC	24
003		SF2005-00	SPCR,4-40 .25 HEX .5L BRS ZINC GVG/A70-SF2005-00 A2	12
004		SH2018-00	STDF,M/F 4-40 .250HEX .375L GVG/A70-SH2018-00 A1	4

REPLACEMENT PARTS LIST

SYS,KIT DISK REMOTE SHIELDED
ASSEMBLY NUMBER: 084717-01 ISSUE: A ECN: Z286

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D06-084717-01	000000-00	REFERENCE DOCUMENTS	0
002		054724-00	CABLE,ASSY C/P TO RMT DSK,SHLD,6 FT 3M/80-6106-58017	1
003		054725-00	CABLE,ASSY RBN RMT DSK ADPT SET POE/054725-00	2
015		074716-01	KIT,RACK MNT ADPT/DISK REMOTE METAL	1
008		NA4002-00	NUT #4-40 1/16x3/16 H NUT,4-40,.0625X.1875,HEX,ZINC PL	4
006		SA1052-01	SCRW,MACH 4-40X.1875L PH PNH W/NYL MACH 4-40X.1875L PH PNH W/NYL ZINC	8
004		TP0324-01	MANUAL,DPM OPT DISK REMOTE	1
010		WA2009-00	WSHR,#4 INTL STAR LOCK ZINC WASHER,#4,INT STAR,ZINC PL	4

REPLACEMENT PARTS LIST

SYS,KIT C/P RACK MNT ADPT/DISK RMT
ASSEMBLY NUMBER: 084718-01 ISSUE: A ECN: Z374

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D06-084718-01	000000-00	REFERENCE DOCUMENTS	0
002		054724-00	CABLE,ASSY C/P TO RMT DSK,SHLD,6 FT 3M/80-6106-58017	1
003		054725-00	CABLE,ASSY RBN RMT DSK ADPT SET POE/054725-00	2
015		074716-01	KIT,RACK MNT ADPT/DISK REMOTE METAL	1
020		074717-01	KIT,RACK MOUNT ADAPTER METAL	1
008		NA4002-00	NUT #4-40 1/16x3/16 H NUT,4-40,.0625X.1875,HEX,ZINC PL	4
006		SA1052-01	SCRW,MACH 4-40X.1875L PH PNH W/NYL MACH 4-40X.1875L PH PNH W/NYL ZINC	8
009		SA1118-00	SCRW,TAP 8-32X.375L POZI PNH CAC/234-37870-012	6
007		SA1291-01	SCRW,MACH 8-32X.562 PH PNH W/NYL MACH 8-32X.562L PH PNH W/NYL ZINC	3
004		TP0325-01	MANUAL,DPM-100 OPT PNL RACK MNT	1
010		WA2009-00	WSHR,#4 INTL STAR LOCK ZINC WASHER,#4,INT STAR,ZINC PL	4

<< GVG - PSD >>

REPLACEMENT PARTS LIST

SYS,EXTENDER OPTION
ASSEMBLY NUMBER: 084719-00 ISSUE: A ECN: W653

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001		064708-00	BRD,EXTENDER CPU/DGTL VIDEO	1
002		064713-00	BRD,EXTENDER ANLG INTERFACE	1
003		074714-00	EXTENDER,METAL FAB KIT	2
014		CC2072-00	CARD GD,NYL 9.62L SNAP-IN SAE/1962F	8
013		CC2079-00	CARD EJCTR,NYL BLK .062 PCB 1.50L CAK/107-10	4
015		HA1128-00	HDW,PLUNGER SPRING EXTDR GVG/A70-HA1128-00 A1	4
016		SA1052-01	SCRW,MACH 4-40X.1875L PH PNH W/NYL MACH 4-40X.1875L PH PNH W/NYL ZINC	20
017		SA1060-01	SCRW,MACH 4-40X.5L PH PNH W/NYL MACH 4-40X.5L PH PNH W/NYL ZINC	8
019		WA2099-00	WSHR,.24IDX.38ODX.06THK FLT GVG/A70-WA2099-00 A1	4
018		WA2100-00	WSHR,SHLDR .144IDX.312ODX.125H GVG/A70-WA2100-00 A1	4

REPLACEMENT PARTS LIST

CONV KIT,DPM100-DPM700,1 CHNL NTSC
ASSEMBLY NUMBER: 084750-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	CONVERSION INSTR W/ COVER LETTER	000000-00	REFERENCE DOCUMENTS	0
002		064700-03	BRD,FRAME CONTROL PROCESSOR	1
001		064741-00	BRD,MULTISTD VID CHNNL 3D	1
004		074743-00	SUBASSY,LENS SET DPM-700 KTI/D31-074743-00	1
006		074752-00	DISK,EFFECTS DPM-700	1
007		074753-00	TAPE,DPM-700 OPERATORS VIDEO NTSC	1
005		084758-00	SYS,DPM-700 SPARE PRGM & DIAG DISK	1
003		PA6019-00	PANEL,PLATE DPM-700 ETM/PA6019-00	1
012	U788 054106-01 (702-03 BD)	SC1714-00	IC,EPLD SAM448-25S 28 DIP ATR/EPS448PC-25	1
010	U53 054162-01 (703 BD)	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	1
011	U607 054101-02 U558 054103-01 U560 054103-01 (702-03 BD)	SC1842-00	IC,EPLD EP610-35PC 24 DIP ATR/EP610-35PC	3
013	U606 054102-03 (702-03 BD)	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	1
023	ECO# Z323 U606 054102-03 (703-03 BD) U607 054101-02 (702-03 BD) U558 054103-01 (702-03 BD) U560 054103-01 (702-03 BD)	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	4
008		TP0342-00	MANUAL,DPM-700 SET	1

REPLACEMENT PARTS LIST

CONV KIT,DPM100-DPM700,2 CHNL NTSC
ASSEMBLY NUMBER: 084751-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	CONVERSION INSTR W/ COVER LETTER	000000-00	REFERENCE DOCUMENTS	0
002		064700-03	BRD,FRAME CONTROL PROCESSOR	1
001		064741-00	BRD,MULTISTD VID CHNNL 3D	2
004		074743-00	SUBASSY,LENS SET DPM-700 KTI/D31-074743-00	1
006		074752-00	DISK,EFFECTS DPM-700	1
007		074753-00	TAPE,DPM-700 OPERATORS VIDEO NTSC	1
005		084758-00	SYS,DPM-700 SPARE PRGM & DIAG DISK	1
003		PA6019-00	PANEL,PLATE DPM-700 ETM/PA6019-00	1
012	U788 054106-01 (702-03 BD)	SC1714-00	IC,EPLD SAM448-25S 28 DIP ATR/EPS448PC-25	1
010	U53 054162-01 (703 BD)	SC1824-00	IC,PAL PALCE22V10H-25 24 DIP AMD/AMPALCE22V10H-25PC	1
011	U607 054101-02 U558 054103-01 U560 054103-01 (702-03 BD)	SC1842-00	IC,EPLD EP610-35PC 24 DIP ATR/EP610-35PC	3
013	U606 054102-03 (702-03 BD)	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	1
023	ECO# Z323 U606 054102-03 (703-03 BD) U607 054101-02 (702-03 BD) U558 054103-01 (702-03 BD) U560 054103-01 (702-03 BD)	SC1993-00	IC,PAL PALCE610H-25PC 24 SKY DIP AMD/PALCE630H-25PC	4
008		TP0342-00	MANUAL,DPM-700 SET	1

<< GVG - PSD >>

REPLACEMENT PARTS LIST

CONV KIT,DPM100-DPM700,1 CHNL PAL
ASSEMBLY NUMBER: 084752-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	CONVERSION INSTR W/ COVER LETTER	000000-00	REFERENCE DOCUMENTS	0
002		064700-03	BRD,FRAME CONTROL PROCESSOR	1
001		064741-10	BRD,MULTISTD VID CHNNL 3D PAL	1
004		074743-00	SUBASSY,LENS SET DPM-700 KTI/D31-074743-00	1
006		074752-00	DISK,EFFECTS DPM-700	1
007		074753-10	TAPE,DPM-700 OPERATORS VIDEO PAL	1
005		084758-00	SYS,DPM-700 SPARE PRGM & DIAG DISK	1
003		PA6019-00	PANEL,PLATE DPM-700 ETM/PA6019-00	1
008		TP0342-00	MANUAL,DPM-700 SET	1

<< G V G - P S D >>

REPLACEMENT PARTS LIST

CONV KIT,DPM100-DPM700,2 CHNL PAL
ASSEMBLY NUMBER: 084753-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	CONVERSION INSTR W/ COVER LETTER	000000-00	REFERENCE DOCUMENTS	0
002		064700-03	BRD,FRAME CONTROL PROCESSOR	1
001		064741-10	BRD,MULTISTD VID CHNNL 3D PAL	2
004		074743-00	SUBASSY,LENS SET DPM-700 KTI/D31-074743-00	1
006		074752-00	DISK,EFFECTS DPM-700	1
007		074753-10	TAPE,DPM-700 OPERATORS VIDEO PAL	1
005		084758-00	SYS,DPM-700 SPARE PRGM & DIAG DISK	1
003		PA6019-00	PANEL,PLATE DPM-700 ETM/PA6019-00	1
008		TP0342-00	MANUAL,DPM-700 SET	1

REPLACEMENT PARTS LIST

SYS,DPM-700 SPARE PRGM & DIAG DISK
ASSEMBLY NUMBER: 084758-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001		074750-00	DISK,PRGM DPM-700	1
002		074751-00	DISK,DIAGNOSTIC DPM-700	1

REPLACEMENT PARTS LIST

SYS,DPM700 SEC CHNL COMPOS ANA NTSC
ASSEMBLY NUMBER: 084764-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
003		064704-00	BRD,SEC CHNL COMBINER MEZZANINE	1
002		064705-01	BRD,NTSC ANLG INPUT SUBMODULE	1
001		064741-00	BRD,MULTISTD VID CHNNL 3D	1

REPLACEMENT PARTS LIST

SYS,DPM700 SEC CHNL COMPOS ANA PAL
ASSEMBLY NUMBER: 084764-10 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
003		064704-00	BRD,SEC CHNL COMBINER MEZZANINE	1
002		064735-00	BRD,PAL INPUT SUBMODULE	1
001		064741-10	BRD,MULTISTD VID CHNNL 3D PAL	1

REPLACEMENT PARTS LIST

SYS,DPM700 SEC CHNL COMPOS DIG NTSC
ASSEMBLY NUMBER: 084765-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
003		064704-00	BRD,SEC CHNL COMBINER MEZZANINE	1
002		064726-00	BRD,D2 INPUT SUBMODULE	1
001		064741-00	BRD,MULTISTD VID CHNNL 3D	1

REPLACEMENT PARTS LIST

SYS,DPM700 SEC CHNL COMPOS DIG PAL
ASSEMBLY NUMBER: 084765-10 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
003		064704-00	BRD,SEC CHNL COMBINER MEZZANINE	1
002		064727-00	BRD,D2 PAL INPUT SUBMODULE	1
001		064741-10	BRD,MULTISTD VID CHNNL 3D PAL	1

REPLACEMENT PARTS LIST

SYS,DPM700 SPR MOD KT CMPS ANA NTSC
ASSEMBLY NUMBER: 084768-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001		064700-03	BRD,FRAME CONTROL PROCESSOR	1
003		064702-03	BRD,MULTISTD NTSC INTERFACE	1
004		064705-01	BRD,NTSC ANLG INPUT SUBMODULE	1
002		064741-00	BRD,MULTISTD VID CHNNL 3D	1

REPLACEMENT PARTS LIST

SYS,DPM700 SPR MOD KT CMPS ANA PAL
ASSEMBLY NUMBER: 084768-10 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001		064700-03	BRD,FRAME CONTROL PROCESSOR	1
003		064722-00	BRD,PAL ANALOG INTERFACE	1
004		064735-00	BRD,PAL INPUT SUBMODULE	1
002		064741-10	BRD,MULTISTD VID CHNNL 3D PAL	1

REPLACEMENT PARTS LIST

SYS,DPM700 SPR MOD KT CMPS DIG NTSC
ASSEMBLY NUMBER: 084769-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001		064700-03	BRD,FRAME CONTROL PROCESSOR	1
003		064702-03	BRD,MULTISTD NTSC INTERFACE	1
004		064726-00	BRD,D2 INPUT SUBMODULE	1
002		064741-00	BRD,MULTISTD VID CHNNL 3D	1

REPLACEMENT PARTS LIST

SYS,DPM700 SPR MOD KT CMPS DIG PAL
ASSEMBLY NUMBER: 084769-10 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
001		064700-03	BRD,FRAME CONTROL PROCESSOR	1
003		064722-00	BRD,PAL ANALOG INTERFACE	1
004		064727-00	BRD,D2 PAL INPUT SUBMODULE	1
002		064741-10	BRD,MULTISTD VID CHNNL 3D PAL	1

REPLACEMENT PARTS LIST

SYS,DPM700 SPARE CNTL PNL
ASSEMBLY NUMBER: 084770-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	D06-084700	000000-00	REFERENCE DOCUMENTS	0
024		034724-00	SHIELD,BOTTOM COVER,CONTROL PANEL PRP/034724-00	1
011		034730-00	COVER,BOTTOM	1
025		054700-00	CABLE ASSY,RBN SW BD TO CPU 50 CNT HAE/B06-054700-00	1
026		054701-10	CABLE ASSY,RBN DSK DRV TO CPU 34CNT HAE/B06-054701-10	1
027		054702-10	CABLE ASSY,PWR DSK DRV TO CPU 4CNT HAE/B06-054702-10	1
028		054703-00	CABLE ASSY,RBN LVRARM TO SW BD 3CNT HAE/B06-054703-00	1
029		054704-00	CABLE ASSY,RBN EMEM TO SW BD 26CNT HAE/B06-054704-00	1
030		054705-00	CABLE ASSY,PWR DSPLY TO SW BD 12CNT HAE/B06-054705-00	1
032		054709-00	CABLE ASSY,PWR SW BD TO CPU 6CNT HAE/B06-054709-00	1
014		064709-00	BRD,CTRL PNL SWITCH	1
015		064710-00	BRD,CNTL PNL PROCESSOR	1
016		064711-00	BRD,DISPLAY & EMEM	1
010		074704-00	SUBASSY,LEVER ARM	1
008		074705-00	SUBASSY,JOY STICK POSITIONER CHP/S30L081P-GV	1
007		074713-01	DISK,BLANK DPM700	1
009		074743-00	SUBASSY,LENS SET DPM-700 KTI/D31-074743-00	1
037		074750-00	DISK,PRGM DPM-700	1
038		074751-00	DISK,DIAGNOSTIC DPM-700	1
100		074752-00	DISK,EFFECTS DPM-700	1
034	4 EA 034700-00	BC6003-00	BUMPER,.75 SQX.25H ADH BACK GRAY 3M/SJ-5023	4
002		CC6029-00	CASE,CONTROL PANEL PUG/D70-CC6029-00	1
036		CF1395-00	CONN,FEMALE SCRWLOCK .312L AMP/205817-3	4
004		EA2226-01	EQPT,DISK DRIVE 3 1/2" DBL SD SNY/MP-F11W-L3	1
003		EA2227-00	EQPT,DSPL MOD VAC FLUOR 80 CHAR IEE/3601-86-080	1

REPLACEMENT PARTS LIST

SYS,DPM700 SPARE CNTL PNL
ASSEMBLY NUMBER: 084770-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
035		KA4056-00	KNOB,BLK MATTE .5DIA .125SFT PUSHON ROG/RB-67-0-M 1/8" MATTE BLK PUSHON	3
001		PA6019-00	PANEL,PLATE DPM-700 ETM/PA6019-00	1
019		SA1053-01	SCRW,MACH 4-40X.25L PH PNH W/NYL MACH 4-40X.25L PH PNH W/NYL ZINC	46
005		SD6021-03	SHIELD,GASKET EMI .45WX12.438L GVG/B70-SD6021-XX	1
006		SD6021-04	SHIELD,GASKET EMI .45WX8.062L GVG/B70-SD6021-XX	1
021		SH2115-00	STDF,FEM 4-40 .250 HEX 1.437L BSO/2119-440-S-12	2
022		SH2116-00	STDF,M/F 4-40 .250 HEX 1.625L BSO/4552-440-S-12	2

REPLACEMENT PARTS LIST

FRAME,ELECTRONICS DPM-700 4RU
ASSEMBLY NUMBER: 084777-00 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999 E06		000000-00	REFERENCE DOCUMENTS	0
005		064700-03	BRD,FRAME CONTROL PROCESSOR	1
007		064702-04	BRD,MULTISTD NTSC INTERFACE 4RU	1
006		064741-00	BRD,MULTISTD VID CHNNL 3D	1
041		074712-00	SUBASSY,KIT SPARE FUSE/LAMP/CONN	1
015		074728-01	FRAME,DPM100 4RU W/O PCB	1
016		074753-00	TAPE,DPM-700 OPERATORS VIDEO NTSC	1
009		LB8003-00	LINE CD,3 CNDCT #18 7.5L W/PL&RCPT BEL/17251	1
030		TP0342-00	MANUAL,DPM-700 SET	1

REPLACEMENT PARTS LIST

FRAME,ELECTRONICS DPM-700 PAL 4RU
ASSEMBLY NUMBER: 084777-10 ISSUE: ECN:

ITM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
999	E06	000000-00	REFERENCE DOCUMENTS	0
005		064700-03	BRD,FRAME CONTROL PROCESSOR	1
007		064722-01	BRD,PAL ANALOG INTERFACE 4RU	1
006		064741-10	BRD,MULTISTD VID CHNNL 3D PAL	1
041		074712-00	SUBASSY,KIT SPARE FUSE/LAMP/CONN	1
015		074728-01	FRAME,DPM100 4RU W/O PCB	1
031		074753-10	TAPE,DPM-700 OPERATORS VIDEO PAL	1
009		LB8003-00	LINE CD,3 CNDCT #18 7.5L W/PL&RCPT BEL/17251	1
030		TP0342-00	MANUAL,DPM-700 SET	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
0001		HB9003-10	HYBRID,VIDEO OP AMP,4 LOAD DRIVER JFX/HB9003-10	1
0002		HB9032-10	HYBRID,VIDEO BUFFER GVG/HB9032-10	1
0003		HB9032-20	HYBRID,VIDEO AMPLIFIER GVG/HB9032-20	1
0005		HB9049-10	HYBRID,EQUALIZING AMP (NPN OUTPUT) JFX/HB9049-10	1
0006		HB9061-00	HYBRID,ORION OUTPUT RES NETWORK HYB/HB9061-00	1
0008		HB9069-00	HYBRID,2 INPUT NEG NAM GVG/HB9069-00	1
0009		HB9069-10	HYBRID,2 INPUT POS NAM GVG/HB9069-10	1
0010		HB9078-00	HYBRID,VIDEO CLAMP GVG/HB9078-00	1
0011		HB9081-02	HYBRID,SYNC STRIPPER GVG/HB9081-02	1
0012		HB9090-00	HYBRID,PULSE SHAPER GVG/HB9090-00	1
0013		HB9099-00	HYBRID,LINEAR V CONT DELAY GVG/HB9099-00	1
0014		HB9118-00	HYBRID,RES NETWORK HYB/HB9118-00	1
0015		HB9120-00	HYBRID,SUBCARRIER FILTER GVG/HB9120-00	1
0017		HB9065-01	HYBRID,2 INPUT VIDEO MULTIPLIER SIP GVG/HB9065-01	1
0020		BA2007-00	BTRY,RECHRG 3.6V .110AMPHR NICAD GVG/A70-BA2007-00 A2	1
0022		CB0283-00	CAP,CER 1000PF 10% 50WV X7R GVG/A70-CB0283-00 A1	2
0023		CB0142-00	CAP,CER .01UF 10% 100WV X7R .2 SP AVX/SR211C103KAA	2
0024		CB0268-00	CAP,CER .01UF 20% 50WV Z5U AXIAL GVG/A70-CB0268-00 A3	5
0025		CB0319-00	CAP,CER .1UF 20% 50WV Z5U .2 SP AVX/SR215E104MAA	3
0026		CB4036-00	CAP,TANT 5.6UF 10% 20WV GVG/A70-CB4036-00 A1	1
0027		CB5001-00	CAP,VAR 2.5-9PF 100WV TOP GVG/A70-CB5001-00 A4	1
0029		CJ2025-00	CRYSTAL,24MHZ CTK/MP240	1
0030		CJ2043-00	CRYSTAL,3.6864MHZ HC-49/U FRQ/375-100-4	1
0031		CJ2047-00	CRYSTAL,10MHZ 14 DIP CTK/MXO-55-GA-2C-10MHZ	1
0032		CJ2048-00	CRYSTAL,1.2288MHZ 14 DIP DAL/XO43B 1.2288MHZ	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
0033		CJ2088-00	CRYSTAL,17.734475MHZ HC-49U GVG/B70-CJ2088-00	1
0034		CJ2061-00	CRYSTAL,16MHZ 14 DIP CTK/MXO-55-GA-2C-16MHZ	1
0039		FB4013-00	FUSE,3 AG 4 AMP BUS/MTH-CW-4	3
0043		PD0114-00	POT,DUAL 5K/5K 20% 360 DEG ROT CLA/PD0114-00	2
0046		SB5015-00	DIODE,VARC MV2109 TO-226A 30-36PF MOT/MV2109	1
0047		PD2024-00	POT,TRIM CERMET 5K 10% TOP BOR/3329H-1-502	1
0048		PD2025-00	POT,TRIM CERMET 200 10% TOP BOR/3329H-1-201	1
0049		PD2027-00	POT,TRIM CERMET 2K 10% TOP BOR/3329H-1-202	1
0050		PD2028-00	POT,TRIM CERMET 20K 10% TOP BOR/3329H-1-203	1
0051		PD2033-00	POT,TRIM CERMET 100 10% TOP BOR/3329H-1-101	1
0052		PD2038-00	POT,TRIM CERMET 100K 10% TOP BOR/3329H-1-104	1
0053		PD2058-00	POT,TRIM 50 OHM 10% TOP BOR/3329H-1-500	1
0056		RA4024-00	RDOUT DSPL,LED DUAL .3 HGT RED GI/MAN74A	1
0057		RA7031-01	RLY,DPDT 5V 125 OHM UL/CSA 2 FORM C ARO/DS2E-S-DC5V	1
0058		RA7037-00	RLY,REED SPST 5V 500OHM W/DIODE SIP CPC/DSS41A05B	1
0065		SB2050-00	DIODE,RECT MBR1635 TO-220AC 35V@16A GVG/A70-SB2050-00 A1	1
0066		SB4035-00	DIODE,ZENER 1N5341B 6.2V@200MA GVG/A70-SB4035-00 A2	1
0067		SB5011-00	DIODE,VARC MV2110 TO-226AC 35-42PF GVG/A70-SB5011-00 O	1
0068		SB6008-00	TRANS,NJFET MPF4392 TO-92 GVG/A70-SB6008-00 A1	1
0069		SB6018-00	TRANS,FET SD215 TO-72-33 CLG/SD215DEG	1
0070		SB6040-00	TRANS,OBSOLETE SEE SB6049-00 GVG/A70-SB6040-00 O	1
0071		SB7007-00	TRANS,NPN MJE521 TO-225AA PWR GVG/A70-SB7007-00 A1	1
0072		SB7006-00	TRANS,PNP MJE371 TO-225AA PWR GVG/A70-SB7006-00 A2	1
0073		SB8003-00	TRANS,NPN 2N4124 TO-92 SM-SIG GVG/A70-SB8003-00 A1	1
0074		SB8004-00	TRANS,PNP 2N4126 TO-92 SM-SIG GVG/A70-SB8004-00 A2	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
0075		SB8005-00	TRANS,NPN 2N4265 TO-92 SM-SIG GVG/A70-SB8005-00 N	1
0076		SB8006-00	TRANS,NPN 2N4401 TO-92 SM-SIG GVG/A70-SB8006-00 A1	1
0077		SB8007-00	TRANS,PNP 2N4403 TO-92 SM-SIG GVG/A70-SB8007-00 A1	1
0078		SB8021-00	TRANS,PNP MPS3640 TO-92 SM-SIG GVG/A70-SB8021-00 A2	1
0079		SB8022-00	TRANS,NPN SPS7348 TO-92 SM-SIG CSC/CEN625	1
0080		SB8023-00	TRANS,PNP MPS6523 TO-92 SM-SIG GVG/A70-SB8023-00 A1	1
0081		SB8026-00	TRANS,NPN MPS6507 TO-92 SM-SIG GVG/A70-SB8026-00 N	1
0082		SB8035-00	TRANS,PNP MPSH81 TO-92 SM-SIG GVG/A70-SB8035-00 A2	1
0083		SB8063-00	TRANS,NPN MPS650 TO-92 SM-SIG GVG/A70-SB8063-00 A1	1
0084		SC0035-00	IC,TTL 7417 14 DIP GVG/A70-SC0035-00 A1	1
0085		SC0125-01	IC,LIN CA3080E 8 DIP GVG/A70-SC0125-01 A2	1
0086		SC0140-01	IC,LIN LM340T-12 TO-220AB NSC ONLY GVG/A70-SC0140-01 A2	1
0087		SC0156-00	IC,LIN MC1496L 14 DIP GVG/A70-SC0156-00 A2	1
0088		SC0195-00	IC,LIN MC78L12ACP TO-92 GVG/A70-SC0195-00 A2	1
0091		SC0335-00	IC,LIN LF398N 8 DIP GVG/A70-SC0335-00 A1	1
0092		SC0352-00	IC,LIN LF351N 8 DIP GVG/A70-SC0352-00 A2	1
0093		SC0483-00	IC,HCMOS 74HC4538 16 DIP GVG/A70-SC0483-00 A3	1
0094		SC0488-00	IC,LIN DAC0802LCJ 16 DIP ANG/DAC-08HD	1
0095		SC0451-00	IC,LIN MC1404AU5 8 DIP GVG/A70-SC0451-00 A1	1
0096		SC0612-00	IC,HCMOS 74HC14N 14 DIP GVG/A70-SC0612-00 A3	1
0097		SC0628-00	IC,LIN LF353N 8 DIP GVG/A70-SC0628-00 A1	1
0098		SC0939-00	IC,CMOS TMC2011AN2C 24 DIP GVG/A70-SC0939-00 A5	1
0099		SC1340-00	IC,LIN LM1881N 8 DIP GVG/A70-SC1340-00 A1	1
0100	USE FOR -00 OR -30	064731-10	BRD,VIDEO RAM MEZZANINE PAL JFX/064731-10	1
0101		SC0897-00	IC,LIN LM336Z-2.5 VOLT REF TO-92 GVG/A70-SC0897-00 A2	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
0102		SC0898-01	IC,LIN TDC1016N7C8 24 DIP GVG/A70-SC0898-01 A6	1
0103		CB0112-00	CAP,CER .01UF 10% 50WV X7R AVX/SR155C103KAA	1
0104		054355-00	PROM,SET-UP FOR DPM	1
0105		SC0977-00	IC,TTL MAX232CPE 16 DIP GVG/A70-SC0977-00 A1	1
0107		SC1019-00	IC,I/F DS8921N 8 DIP GVG/A70-SC1019-00 A1	1
0108		CB4022-00	CAP,TANT 22UF 10% 15WV GVG/A70-CB4022-00 A1	1
0109		SC1093-01	IC,LIN XPT -11MV TO -25MV DC EXR/XR-C0668A	1
0110		SC1102-00	IC,LIN SG3525AN 16 DIP GVG/A70-SC1102-00 A1	1
0111		SC1123-00	IC,HCMOS 74HC4051 16 DIP MOT ONLY GVG/A70-SC1123-00 A2	1
0112		SC1149-00	IC,MEM IDT7216L-55J 68 PLCC AMD/AM29C516AJC	1
0114		SC1435-00	IC,ACMOS 74AC244PC 20 DIP GVG/A70-SC1435-00 A2	1
0115		SC1280-00	IC,MEM P51256SL-10 28 DIP GVG/A70-SC1280-00 A4	2
0116		SC1311-00	IC,ACMOS 74ACT374PC 20 DIP GVG/A70-SC1311-00 A2	1
0117		SC1344-00	IC,ASIC VID LINE DRVR 52 PLCC GVG/A70-SC1344-00 A3	1
0118		SC1360-00	IC,HCMOS 74HC259N 16 DIP GVG/A70-SC1360-00 A1	1
0119		SC1410-00	IC,ASIC SYNC SEP & CLAMP 44 PLCC ATT/LB1174AP	1
0120		SC1411-01	IC,ASIC COLORLOCK 44 PLCC ATT/LB1182BP	1
0121		CB4019-00	CAP,TANT 6.8UF 10% 15WV GVG/A70-CB4019-00 A2	1
0122		CB0281-00	CAP,CER 2200PF 10% 100WV X7R GVG/A70-CB0281-00 A2	1
0123		CB0285-00	CAP,CER .047UF 10% 50WV X7R GVG/A70-CB0285-00 A1	1
0124		CB0132-00	CAP,CER .1UF 20% 50WV Z5U AXIAL GVG/A70-CB0132-00 A2	3
0125		SC1501-00	IC,UP MC68450RC10 68 PGA GVG/A70-SC1501-00 A1	1
0126		SC1520-00	IC,ASIC VAR PIPE REG 44 PLCC GVG/A70-SC1520-00 A3	1
0127		SC1537-00	IC,ACMOS 74ACT373PC 20 DIP GVG/A70-SC1537-00 A2	1
0128		SC1609-00	IC,ACMOS 74AC139 16 DIP GVG/A70-SC1609-00 A2	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
0129		CB5002-00	CAP,VAR 3.5-20PF 100WV TOP GVG/A70-CB5002-00 A4	1
0130		CJ2065-00	CRYSTAL,33.3333MHZ OSC 14 DIP CTK/MXO-55-GA-2C-33.333MHZ	1
0131		CJ2136-00	CRYSTAL,27MHZ HC49/U FOX/S20814-8	1
0132		DA4022-00	DLY LN,1000NS Z:500 TR:100NS DDD/2211-1000G	1
0133		DA4165-00	DLY LN,TTL 50NS W/5NS TAPS DDD/DDU-7F-8955	1
0134		DA4181-00	DLY LN, 5NS/STEP 3BIT PRGRMBLE DDD/PDU-13F-5	1
0135		SC1676-01	IC,LIN TDC1038N6C 28 DIP RYS ONLY GVG/A70-SC1676-01 A1	1
0136		SC1679-00	IC,ASIC DGTL MIXER/ACCUM 84 PLCC LSI/L1A5047	1
0137		SC1680-00	IC,ASIC ITERATIVE ADDER 84 PLCC LSI/L1A5048	1
0138		SC1685-00	IC,I/F DP8473AV 52 PLCC GVG/A70-SC1685-00 A2	1
0139		SC1686-00	IC,CMOS MAX172BCNG 24 DIP GVG/A70-SC1686-00 A1	1
0140		SC1687-00	IC,UP MC68010FN10 68 PLCC GVG/A70-SC1687-00 A1	1
0141		SC1688-00	IC,UP MC68681FN 44 PLCC GVG/A70-SC1688-00 A1	1
0142		SC1690-00	IC,PAL XC2064-70PC68C 68 PLCC GVG/A70-SC1690-00 A4	1
0143		SC1691-00	IC,ACMOS 74AC10 14 DIP GVG/A70-SC1691-00 A1	1
0144		SC1692-00	IC,ACMOS 74ACT138 16 DIP GVG/A70-SC1692-00 A1	1
0145		SC1702-00	IC,ASIC NTSC/PAL ENC/DEC 120 PGA VLS/VY04678-1	1
0146		SC1703-00	IC,ASIC DGTL FIR FLTR 144 PGA VLS/ZY04680-1	1
0147		DA4182-00	DLY LN,20NS TR:2NS TP:5 8 SIP DDD/DDU-222F-20	1
0148		SC1713-00	IC,ACMOS 74ACT574 20 DIP GVG/A70-SC1713-00 A2	3
0149		DA4183-00	DLY LN,DUAL 6NS TR:2NS 8 DIP DDD/MDU-28F-6	1
0150		SC2060-00	IC,ASIC DGTL 4 LN DLY/ADDS 84 PLCC NSC/MM9249-V5	1
0151		SC1719-00	IC,ACMOS 74ACT573 20 DIP GVG/A70-SC1719-00 A2	1
0152		SC1720-00	IC,ACMOS 74ACT157 16 DIP GVG/A70-SC1720-00 A1	1
0153		SC1721-00	IC,ACMOS 74ACT821 24 DIP GVG/A70-SC1721-00 A2	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
0154		SC1723-00	IC,ACMOS 74ACT541 20 DIP GVG/A70-SC1723-00 A2	1
0155		SC1724-00	IC,ACMOS 74ACT174 16 DIP GVG/A70-SC1724-00 A1	1
0156		SC1725-00	IC,ACMOS 74ACT175 16 DIP GVG/A70-SC1725-00 A1	1
0157		SC1354-00	IC,LIN LM324N 14 DIP GVG/A70-SC1354-00 A1	1
0158		SC1454-00	IC,ACMOS 74AC86 14 DIP GVG/A70-SC1454-00 A2	1
0159		SC1461-00	IC,ACMOS 74AC573 20 DIP GVG/A70-SC1461-00 A2	1
0160		SC1730-00	IC,ACMOS 74ACT823 24 DIP GVG/A70-SC1730-00 A2	1
0161		SC1732-00	IC,UP MAX693 16 DIP GVG/A70-SC1732-00 A1	1
0162		SC1733-00	IC,I/F DP8310N 20 DIP GVG/A70-SC1733-00 A1	1
0163		SC1735-00	IC,UP MC68440FN10 68 PLCC GVG/A70-SC1735-00 A1	1
0164		SC1462-00	IC,ACMOS 74AC574 20 DIP GVG/A70-SC1462-00 A2	1
0165		SC1737-00	IC,UP TMS320C10FNL25 44 PLCC GVG/A70-SC1737-00 A1	1
0167		SC1743-00	IC,ACMOS 74ACT86 14 DIP GVG/A70-SC1743-00 A2	1
0168		DA4184-00	DLY LN,0-75NS TP:5NS 24 DIP PROG DDD/PDU-14F-5	1
0169		SC1773-00	IC,I/F MM74C911 28 DIP GVG/A70-SC1773-00 A1	1
0170		SC1804-00	IC,ACMOS 74ACT399 16 DIP GVG/A70-SC1804-00 A1	1
0171		SC1780-00	IC,FTTL 74F537 20 DIP GVG/A70-SC1780-00 A1	1
0172		SC1825-00	IC,MEM P28F010-150 32 DIP AMD/AM28F010-150PC	1
0173		SC1991-00	IC,ACMOS 74AC541 20 DIP GVG/A70-SC1991-00 A1	1
0174		SC1994-00	IC,ACMOS 74AC174 16 DIP GVG/A70-SC1994-00 A1	1
0175		SC1826-00	IC,MEM P28F512-200 32 DIP AMD/AM28F512-200PC	2
0176		SC1827-00	IC,UP SCB68155CAA44 44 PLCC GVG/A70-SC1827-00 O	1
0177		SC1841-00	IC,CMOS L29C520PC-1 24 DIP GVG/A70-SC1841-00 A2	1
0178		SC2009-00	IC,FTTL 74F525 28 PLCC GVG/A70-SC2009-00 A1	1
0179		HB9067-01	HYBRID,DIGITAL INPUT TERMINATION GVG/HB9067-01	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
0180		SC1863-00	IC,UP MC68882RC16A 68 PGA GVG/A70-SC1863-00 A1	1
0181		SC1872-00	IC,EPLD XC2018-70PC68C 68 PLCC GVG/A70-SC1872-00 A1	1
0182		SC7001-00	IC,ASIC PIPELN/NAM 52 PLCC NSC ONLY GVG/A70-SC7001-00 A4	1
0183		HB9077-10	HYBRID,VIDEO AMP GVG/HB9077-10	1
0184		HB9077-00	HYBRID,VIDEO BUFFER GVG/HB9077-00	1
0185		SJ0074-00	SW,PB SPDT MOM PCB MTG CKC/8121-S-D9-A-G-E	1
0187		SJ0241-00	SW,RKR DPST 16A@250V I/O ARE/C1550-A-A-B-W-EN602A-B	1
0188		ZB4122-00	INDCTR,20UH HIGH CURRENT GOW/50-235	1
0189		HB9031-02	HYBRID,NON ADD MIXER NEG GVG/HB9031-02	1
0190		HB9032-30	HYBRID,VIDEO BUFFER GVG/HB9032-30	1
0191		HB9105-01	HYBRID,HARD CLAMP HYB/39-QS9105-01	1
0192		PD0034-00	POT,DUAL 10K/10K 20% LIN .25X.125 CLA/24M317	1
0193		PD2012-00	POT,TRIM CERMET 1K 10% TOP BOR/3329H-1-102	1
0194		PD2013-00	POT,TRIM CERMET 10K 10% TOP BOR/3329H-1-103	1
0195		PD2015-00	POT,TRIM CERMET 500 10% SIDE BOR/3329W-1-501	1
0196		PD2016-00	POT,TRIM CERMET 1K 10% SIDE BOR/3329W-1-102	1
0197		PD2017-00	POT,TRIM CERMET 2K 10% SIDE BOR/3329W-1-202	1
0198		QS1184-00	IC,ASIC DGTL FILTER W/RAM 132 QFP NSC/MM9248-VF8	1
0199		SB2001-00	DIODE,RECT 1N4002 DO-41 100V@1A GI/1N4002-00	1
0200		SB3001-00	DIODE,SIG 1N4148 DO-35 100MA GVG/A70-SB3001-00 A3	5
0201		SB1018-00	DIODE,LED MV5453 GRN WIDE-BEAM GVG/A70-SB1018-00 A2	1
0202		SB5010-00	DIODE,VARC MV1404 DO-204AA 96-144PF GVG/A70-SB5010-00 A1	1
0203		SB8038-00	TRANS,PNP 2N2905A TO-39 SM-SIG GVG/A70-SB8038-00 A1	1
0204		SB8045-00	TRANS,NPN PN2222A TO-92 SM-SIG GVG/A70-SB8045-00 A1	1
0205		SC0573-00	IC,ECL MC10124P 16 DIP GVG/A70-SC0573-00 A1	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
0206		SC0583-00	IC,LIN LM319N 14 DIP GVG/A70-SC0583-00 A1	1
0207		SC0594-00	IC,HCMOS 74HC74 14 DIP GVG/A70-SC0594-00 A3	1
0208		SC0874-00	IC,ECL MC12040P 14 DIP GVG/A70-SC0874-00 A1	1
0209		SC0639-00	IC,ECL MC10114P 16 DIP GVG/A70-SC0639-00 A1	1
0210		SC0721-00	IC,ECL MC10125P 16 DIP GVG/A70-SC0721-00 A3	1
0211		SC1244-00	IC,CMOS BT102BC 24 DIP BRT/BT102BC	1
0212		SC1356-00	IC,FTTL 74F574PC 20 DIP NSC ONLY NSC/74F574PC	1
0213		SC1364-00	IC,HCMOS 74HC574A 20 DIP GVG/A70-SC1364-00 A2	1
0214		SC1436-00	IC,ACMOS 74AC245PC 20 DIP GVG/A70-SC1436-00 A2	1
0215		SJ0230-00	SW,LT PB MOD SPST/DPST 5V@10MA GVG/A70-SJ0230-00 A4	5
0216		SC1459-00	IC,ACMOS 74AC175 16 DIP GVG/A70-SC1459-00 A2	1
0217		SC1465-00	IC,ACMOS 74ACT240PC 20 DIP GVG/A70-SC1465-00 A2	1
0218		SC1641-00	IC,ACMOS 74ACT245PC 20 DIP GVG/A70-SC1641-00 A2	1
0220		SC1738-01	IC,MEM IDT7130SA35J 52 PLCC 35NS CYP/CY7C131-35JC	1
0221		SC1741-01	IC,MEM IDT7132SA35J 52 PLCC 35NS GVG/A70-SC1741-01 A1	1
0222		SC1805-00	IC,ACMOS 74ACT841 24 SKY DIP GVG/A70-SC1805-00 A2	1
0223		SC1818-00	IC,ASIC 12 BIT MIXER 84 PLCC VLS/VY04730-1	1
0224	USE SC2198-00 IN PLACE OF THIS ITEM	SC1924-00	IC,CMOS TMC2246AH5C 120 PGA GVG/A70-SC1924-00 A2	0
0226		SC1906-01	IC,MEM MSM514221B-30RS 16 DIP GVG/A70-SC1906-01 A2	1
0227		SC2162-00	IC,UP AM29CPL154H-30DC 28 DIP AMD/AM29CPL154H-30DC	1
0228		SC2078-00	IC,ASIC DGTL FILTER W/RAM 84 PLCC NSC/MM9248/V5	1
0229		SC2100-00	IC,DGTL TMC3211H5C 121 PGA GVG/A70-SC2100-00 A2	1
0230		SC2198-00	IC,CMOS TMC2246H5C1 120 PGA GVG/A70-SC2198-00 A2	1
0232		SC2101-00	IC,PGA XC3030-70PC84C 84 PLCC ATT/ATT3030-70M84	1
0234		SC2142-00	IC,ACMOS 74ACQ244 20 DIP	1

REPLACEMENT PARTS LIST

SPARE PARTS KIT,DPM100/700,ALL VERS
ASSEMBLY NUMBER: 91-084732-00 ISSUE: ECN:

ITEM NO	REFERENCE DESIGNATOR	GVG PART NUMBER	DESCRIPTION MFG CODE/PART NUMBER	QTY
			GVG/A70-SC2142-00 A1	
0235		SC2083-00	IC,LIN LT1185CT TO-220-5 GVG/A70-SC2083-00 A1	1
0236		SJ0249-00	SW,DGTL HEX 16POS 1 STA PCB GVG/A70-SJ0249-00 A1	1
0237		SC2084-00	IC,LIN LT1086CT TO-220 GVG/A70-SC2084-00 A1	1
0238		SC2199-00	IC,LIN LT1013CN8 8 DIP GVG/A70-SC2199-00 A2	1
0239		SC2201-00	IC,ACMOS 74ACT109 16 DIP GVG/A70-SC2201-00 A1	1
0240		SC2219-00	IC,ACMOS 74AC843 24 DIP GVG/A70-SC2219-00 A1	1
0241		SC2160-00	IC,LIN LM35CAZ TO-92 GVG/A70-SC2160-00 A1	1
0242		SC2141-00	IC,ACMOS 74ACQ240 20 DIP GVG/A70-SC2141-00 A1	1
0243		SC2143-00	IC,ACMOS 74ACQ543 24 DIP GVG/A70-SC2143-00 A1	1
0244		SC7014-00	IC,ASIC 12 BIT MPY/NAM/ADD 52 PLCC GVG/A70-SC7014-00 A1	1
0245		SC1884-00	IC,ASIC 16 BIT NAM/ADD/MPY 68 PLCC NSC/MM9209/V4	1
0248		SC2091-00	IC,UP MC68EC030RP40 124 PGA GVG/A70-SC2091-00 A2	1
0249		SC2200-00	IC,UP MC68882RC33A 68 PGA GVG/A70-SC2200-00 A1	1
0252		SC7004-01	IC,ASIC CLIP & GAIN 52 PLCC NSC/MM9329V3 52PLCC	1
0302	REWORKS: USE 064731-10 IN PLACE OF THIS ITEM.	064731-30	BRD,VIDEO RAM MEZZANINE D1 625 JFX/064731-30	0
0303	USE SC1738-01 IN PLACE OF THIS ITEM	SC1738-00	IC,MEM 7130SA55 52 PLCC CYP/CY7C131-55JC	0
0304	USE SC1741-01 IN PLACE OF THIS ITEM	SC1741-00	IC,MEM IDT7132SA55J 52 PLCC GVG/A70-SC1741-00 A1	0
0305	REWORKS: USE 064731-10 IN PLACE OF THIS ITEM.	064731-00	BRD,VIDEO RAM MEZZANINE NTSC JFX/064731-00	0
0356		SC1005-00	IC,CMOS CWB308CP 16 DIP CLG/CWB308CP	1
0998		TP0372-00	MANUAL,SPARES KIT IMPORTANT NOTICE	1

DELTRON POWER SUUPLY

COMPONENT DESIGNATOR	DELTRON PART NO.	DESCRIPTION OR MANUFACTURING PART NO.
---	A17445-1	TEST PROCEDURE, 11294XA
---	C17447-1	SCHEMATIC, 11294XA
U001	3010023	16 PIN DIP, 3524 PWM
U002	3020061	DUAL COMPARATOR, LM393P
U050	3020142	TL431CP, DIP, 3 TERM. REG.
U304	3030067	LM337T, T0220, NEG 3 TERM REG
D006	3040011	DO15 RECT., 1.5A, 1N5392
D203	3040020	DO15 RECT, 1.5A, 1N5391
D303	3040020	DO15 RECT, 1.5A, 1N5391
D403	3040020	DO15 RECT, 1.5A, 1N5391
D014	3100014	DO41 RECT, FR, 1A, 1N4937
D015	3100014	DO41 RECT, FR, 1A, 1N4937
D012	3100022	DO41 RECT, FR, 1A, 1N4933
D013	3100022	DO41 RECT, FR, 1A, 1N4933
D050	3100022	DO41 RECT, FR, 1A, 1N4933
D051	3100022	DO41 RECT, FR, 1A, 1N4933
D007	3100031	DO41 RECT., 1N4934
D008	3100031	DO41 RECT., 1N4934
D009	3100031	DO41 RECT., 1N4934
D010	3100031	DO41 RECT., 1N4934
D005	3120074	BRIDGE RECT., PP40
D053	3150062	RECT, DUAL SCHOTTKY, MBR3035, 30A
Q001	3240070	TRANSISTOR, PN3567, TO-92
Q002	3240070	TRANSISTOR, PN3567, TO-92
D003	3275001	ZENER DIODE, 33V, P6KE33A, 5W
V001	3290034	130V, 10J, V130LA10A
V002	3290034	130V, 10J, V130LA10A
C011	3430081	2/2, 2UF, 250V, TRW
R063	3494306	RES., 10 OHM, 5%, 1/4W
R064	3494306	RES., 10 OHM, 5%, 1/4W
R065	3494306	RES., 10 OHM, 5%, 1/4W
D401	3140075	RECT., 8A, MUR815
D402	3140075	RECT., 8A, MUR815
D201	3150089	RECTIFIER, C.T. MOTOROLA
D301	3140075	RECT., 8A, MUR815
D302	3140075	RECT., 8A, MUR815
D103	3150062	RECT, DUAL SCHOTTKY, MBR3035,30A
Q003	3265030	TRANSISTOR, MJH16008, NPN, TO-218
Q004	3265030	TRANSISTOR, MJH16008, NPN, TO-218
C017	3380297	CAP, 560UF, 200V
C018	3380297	CAP, 560UF, 200V
F001	3591115	FUSE, 6A, MTH6

THESE ARE AVAILABLE FROM: DELTRON INC.
WISSAHICKON AVENUE
NORTH WALES, PA 19454
215/699-9261

Section 8
Drawings

INTRODUCTION

This section contains drawings for the DPM-700 Digital Picture Manipulator. The drawings are listed in Table 8-1 in numerical order (from low to high) by assembly number.

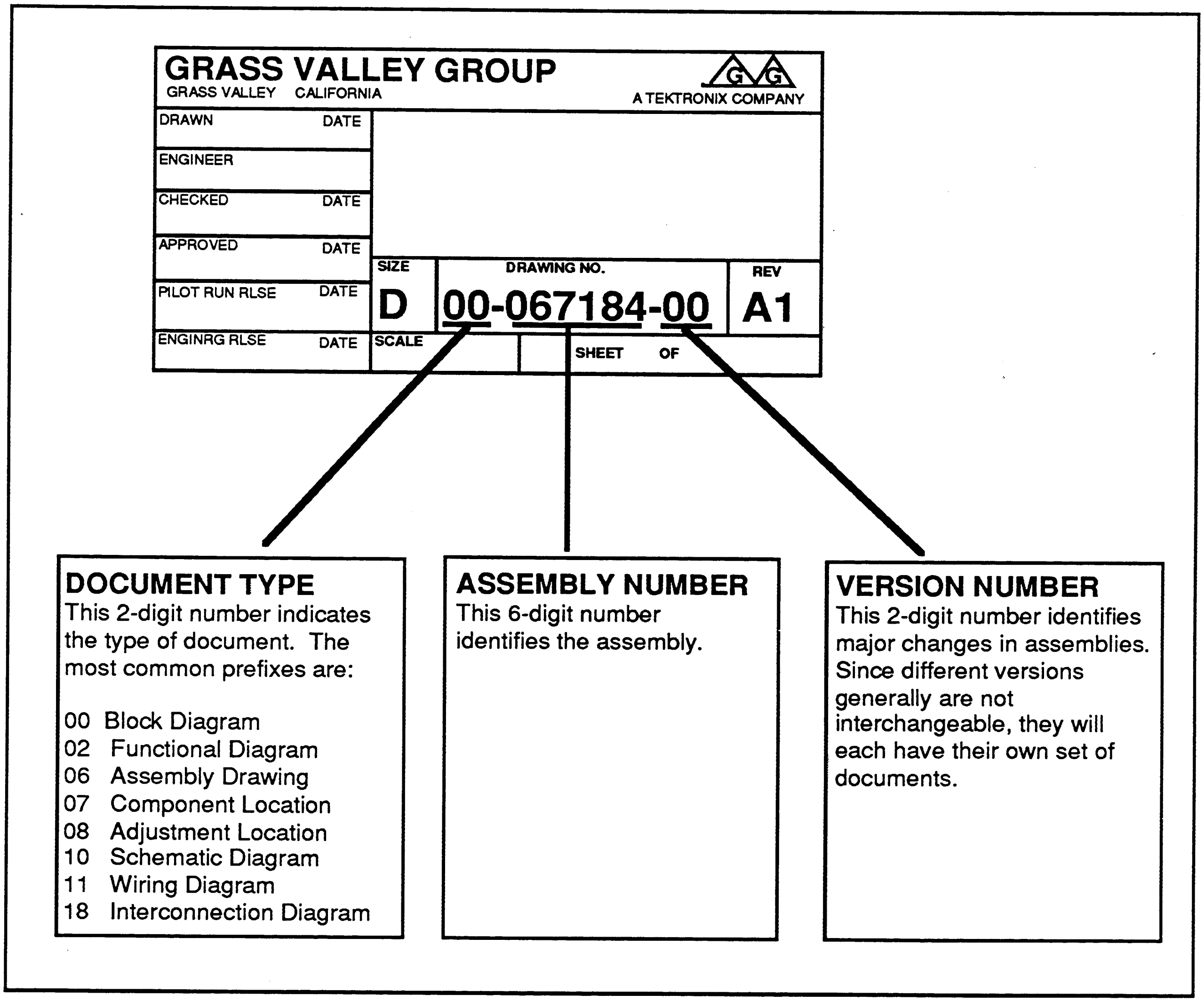
DRAWING NUMBERING SYSTEM

A title block located in the lower right-hand corner of every GVG drawing indicates the drawing name, size, revision level (Rev), and drawing number. Figure 8-1 shows a sample title block.

- The size section of the title block consists of a letter which indicates the original drawing size.
- The revision level section (Rev) changes whenever there is a minor change in an assembly. Assemblies with higher Rev letters replace assemblies with lower letters . For example, an assembly with a Rev level of D1 replaces an assembly with a Rev level of A1.
- The drawing number is made up of three parts: a two-digit document type number followed by the assembly number, and a 2-digit version number.

- The two-digit document type number indicates the type of drawing. Refer to Figure 8-1 for a list of the most common drawing types.

- The version number changes whenever there has been a major change in an assembly. Assemblies with different version numbers may not be interchangeable. Different versions are covered by their own unique sets of documentation unless otherwise noted on a Change Information Sheet. For example, the schematic for an 064700-00 module doesn't apply to an 064700-01 module.


GRASS VALLEY GROUP
GRASS VALLEY CALIFORNIA
GVG
A TEKTRONIX COMPANY
DRAWN DATE
ENGINEER
CHECKED DATE
APPROVED DATE
PILOT RUN RLSE DATE
ENGINRG RLSE DATE
SIZE
D
DRAWING NO.
00-067184-00
REV
A1
SCALE
SHEET OF

DOCUMENT TYPE
This 2-digit number indicates the type of document. The most common prefixes are:

00 Block Diagram
02 Functional Diagram
06 Assembly Drawing
07 Component Location
08 Adjustment Location
10 Schematic Diagram
11 Wiring Diagram
18 Interconnection Diagram

ASSEMBLY NUMBER
This 6-digit number identifies the assembly.

VERSION NUMBER
This 2-digit number identifies major changes in assemblies. Since different versions generally are not interchangeable, they will each have their own set of documents.

Figure 8-1. Drawing Numbering System

Table 8-1. DPM-700 Drawings

Number	Title
Assemblies	
C06-074704	Lever Arm, assembly drawing
B06-074705	Joystick, assembly drawing
06/11-074707	Power Supply, assembly drawing
D06-074716	Disk Remote Option, assembly drawing
D06-074717	Rack Mount Assembly Drawing
C06-074719	Front Cover, assembly drawing
C06-074721	Fan, assembly drawing
C06-074725	Motherboard Assembly, assembly drawing
D31-074743	Lens Set, designation drawing
D06-084770	Control Panel, assembly drawing
E06-084701-02	Frame Electronics, NTSC, assembly drawing
E06-084701-11	Frame Electronics, PAL, assembly drawing
Cables	
B06-054700	Cable, Ribbon Switch Bd To CPU, assembly drawing
B06-054701	Cable Ribbon, Disk Drv To CPU, assembly drawing
B06-054702	Cable, Power Disk Drv To CPU, assembly drawing
B06-054703	Cable, Ribbon Lever Arm To Sw Bd, assembly drawing
B06-054704	Cable, Ribbon E-mem To Sw Bd 26, assembly drawing
B06-054705	Cable, Power Display To Sw Bd 12, assembly drawing
B06-054709	Cable, Pwr Switch Bd To CPU, assembly drawing
C06-054714	Cable, DPM Slave/Model 100 Serial, assembly drawing
C06-054717	Control Cable, 10, 30, 100 meters, assembly drawing
VOLUME 2	
Modules	
D00-064700	Frame Control Processor, block diagram
B07/08-064700	Frame Control Processor, component location
D10-064700	Frame Control Processor, schematic diagram
D00-064702	NTSC Interface, block diagram
B07/08-064702	NTSC Interface, component location
D10-064702	NTSC Interface, schematic diagram
D00-064703	Recursive Memory Module, block diagram
B07/08-064703	Recursive Memory Module, component location
D10-064703	Recursive Memory Module, schematic diagram

Table 8-1 cont. DPM-700 Drawings

Number	Title
Modules	
D00-064704	2-Channel Combiner Mezzanine, block diagram
B07/08-064704	2-Channel Combiner Mezzanine, component loc.
D10-064704	2-Channel Combiner Mezzanine, schematic
D00-064705	Analog Input Submodule, NTSC, block diagram
B07/08-064705	Analog Input Submodule, NTSC, component location
D10-064705	Analog Input Submodule, NTSC, schematic diagram
D10-064708	Digital Extender Board Connections, schematic diag.
D00-064709/710/711	Control Panel Modules, block diagram
B07/08-064709	Control Panel Switch Board, component location
D10-064709	Control Panel Switch Board, schematic diagram
B07/08-064710	Control Panel Processor, component location
D10-064710	Control Panel Processor, schematic diagram
B07/08-064711	Panel Display & EMEM Board, component location
D10-064711	Panel Display & EMEM Board, schematic diagram
D10-064713	Interface Extender Board Connections, schematic
	Motherboard Schematic Preface
D10-064716	Interior Motherboard, schematic diagram
D10-064717	Exterior Motherboard, schematic diagram
D00-064722	PAL Analog Interface, block diagram
B07/08-064722	PAL Analog Interface, component location
D10-064722	PAL Analog Interface, schematic diagram
D00-064726	D2 Input Submodule, NTSC, block diagram
B07/08-064726	D2 Input Submodule, NTSC, component location
D10-064726	D2 Input Submodule, NTSC, schematic diagram
D00-064727	D2 Input Submodule, PAL, block diagram
B07/08-064727	D2 Input Submodule, PAL, component location
D10-064727	D2 Input Submodule, PAL, schematic diagram
B07/08-064731	Static Ram Mezzanine, component location
D10-064731	Static Ram Mezzanine, schematic diagram

Table 8-1 cont. DPM-700 Drawings

Number	Title
Modules	
B07/08-064732	Recursive RAM Mezzanine, component loc.
D10-064732	Recursive RAM Mezzanine, schematic diagram
D00-064735	PAL Composite Input Submodule, block diagram
B07/08-064735	PAL Composite Input Submodule, component location
D10-064735	PAL Composite Input Submodule, schematic diagram
D00-064741-00/10	Digital Video Processor, NTSC/PAL, block diagram
B07/08-064741-00/10	Digital Video Processor, NTSC/PAL, component loc.
D10-064741-00/10	Digital Video Processor, NTSC/PAL, schematic diagram
D00-064742-00/10	3D RAG Mezzanine, NTSC/PAL, block diagram
B07/08-064742-00/10	3D RAG Mezzanine, NTSC/PAL, component loc.
D10-064742-00/10	3D RAG Mezzanine, NTSC/PAL, schematic diagram
D00-064743-00/10	Filter Control Mezzanine, NTSC/PAL, block diagram
B07/08-064743-00/10	Filter Control Mezzanine, NTSC/PAL, component loc.
D10-064743-00/10	Filter Control Mezzanine, NTSC/PAL, schematic diag.
Deltron Power Supply Drawings	
D16769-1	Deltron PC Board
D51699-332	Deltron PS Assy. Dwg.
C17447-1	Deltron 11294XA